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9-2014

## ME-EM eNewsBrief, September 2014

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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# ME-EM

**Michigan Tech** eNewsBrief Volume 10 Issue 3 - SEP 2014



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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](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.

### Upcoming Events

The ME Scholarship Winter Carnival Alumni Hockey Social will be held on Saturday, February 7, 2015, during the Michigan Tech versus Bemidji State hockey game in the Husky Suite South Skybox of the Student Development Complex (SDC). The game has a 5:07 PM start time. Join us for this fun filled event. Cost of the hockey social is \$30 per person which covers a \$15 donation to a ME department scholarship and the hockey suite ticket. Pizza, hot dogs, soda, beer, wine, etc. compliments of the ME-EM Department. Please RSVP to Kathy at [kagoulet@mtu.edu](mailto:kagoulet@mtu.edu) or 906-487-2911 to reserve yours.



### 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 fall:  
November 13—18, Montreal, Quebec Canada for the ASME fall conference.  
November 18—19, Toronto, Ontario Canada, to meet with alumni  
November 19, Detroit, MI to meet with alumni.

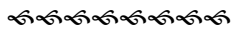
### Past Events



The Department of Mechanical Engineering - Engineering Mechanics again hosted the ME-EM Scholarship Alumni Cruise during the Michigan Tech Annual Alumni Reunion aboard the Ranger III. Alumni, friends, faculty, and staff cruised down the Portage Canal on Thursday, August 7th. Photos can be viewed at [cruise](#).

## Alumni and Friends News, Accomplishments & Awards

The Michigan Technological University's Board of Control bestowed the Melvin Calvin Medal of Distinction on **Richard Henes** (BSME '48). The Melvin Calvin Medal of Distinction is awarded to individuals associated with the University who have exhibited especially distinguished professional and personal accomplishments. Read the article at [Henes](#).



**Col. Merrily Madero** (BSME '85)

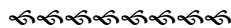


(photo courtesy of M. Madero)

has been using the problem solving skills she initially learned as a Mechanical Engineer

at MTU to solve problems around the world. Recently she was awarded the Bronze Star Medal for leading the Military Liaison unit at the U.S. Embassy in Kabul, Afghanistan during multiple attacks. She also supported

the U.S. Embassy during 53 outside-the-wire missions in 20 different provinces throughout Afghanistan, bringing military support to numerous reconstruction and aid projects. She was the first Colonel to receive the US State Departments' Meritorious Honor Award, the highest award a U.S. Ambassador can present, for her almost 13 months serving at the US Embassy, Kabul, Afghanistan. Col Madero was then selected to lead Air Force Space Command (AFSPC) though one of the largest force draw-downs in the history of the USAF, as the Director of Manpower, Personnel and Services. She also led the AFSPC Senior Steering Group to completely re-organize the 1000+ AFSPC headquarters to most efficiently absorb significant personnel cuts and maintain their current critical space and cyber mission.



**John** (BSME '69) and **Cathi Drake** have expanded their support of an endowed position in the Department of Mechanical Engineering - Engineering Mechanics from a professorship to a chair with an additional \$1M commitment. **Dr. Gordon G.**

**Parker** (professor, ME-EM) who was appointed to the John and Cathi Drake Professor in Mechanical Engineering-Engineering Mechanics when it was established in 2007 has been named the John and Cathi Drake Chair in Mechanical Engineering-Engineering Mechanics. Read the article at [Drake](#).



Three former Michigan Tech hockey players have recently signed National Hockey League (NHL) contracts including two mechanical engineering graduates. **John Scott** (BSME '10) who played for the Huskies from 2002 to 2006 has signed with the San Jose Sharks. **Chris Conner** (BSME '06) who played for the Huskies from 2002 to 2006 has signed with the Washington Capitals. Read the article at [hockey](#).



**David Strenski** (BSME '86) was featured in a HomePower article about his volunteer work designing and installing solar powered systems in homes in Ypsilanti. The article can be read at [solar](#).

## Department Accomplishments



The **Michigan Tech Mobile lab** was on the road the week of July 7th at the Combat Readiness Training Center in Alpena, MI for an outreach activity with the Michigan Civil Air Patrol Summer Cadet Encampment. The Mobile Lab staff spent two days with 147 cadets, from around the Midwest, discussing STEM career opportunities and performing hands on demonstra-

tions. The outreach event was funded with a Michigan Space Grant Consortium award titled; "High Impact STEM Outreach Utilizing the Michigan Tech Mobile Laboratory at the 2014 Michigan Civil Air Patrol Summer Cadet Encampment," **Marlene Lappeus** (program coordinator & distance learning advisor, ME-EM) was the PI and **Jeremy Worm** (research engineer and instructor) was the Co-PI.



The ME-EM Department hosted a **Research Day** on September 30, 2014, where faculty and graduate students



presented posters describing on-going and future research activities. See the slide show at [research](#).

## Our 2013 ME- EM Annual Report



will be in the mail shortly. If you would like a copy and have not received one by the end of November, please call (906) 487-2551 to have a copy sent to you. See the Report by clicking on the picture.



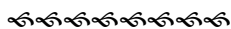
### New Faculty Mechanical Engineering- Engineering Mechanics



**Andrew  
Barnard, PhD**

[webpage](#)

Dr. Barnard joins the Department of Mechanical Engineering-Engineering Mechanics as an assistant professor. Andrew comes to Michigan Tech from Penn State University where he was a research associate in the Applied Research Laboratory. He is a Michigan Tech alumnus, holding a master's in mechanical engineering. Andrew earned a PhD in Acoustics from Penn State. He is a member of the Acoustical Society of America and a board-certified member of the Institute for Noise Control Engineering. He has also been a reviewer for the Journal of Sound and Vibration, the Journal of Building and Environment, Noise Control Engineering Journal and the ASME Noise Control and Acoustics Division.



**Jaclyn  
Johnson, PhD**

[webpage](#)

Dr. Johnson joins the Department of Mechanical Engineering-Engineering Mechanics as a lecturer. Previously, she was an instructor and research

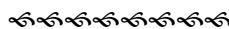
staff member at Michigan Tech. Jaclyn is a Tech alumna, where she received her PhD in Mechanical Engineering-Engineering Mechanics and her master's in mechanical engineering. Her teaching interests are energy thermofluids and solid mechanics. Her research interests are in combustion, diesel spray characteristics and structure and fundamental spark ignition studies of gaseous fuels.



**Aneet  
Narendranath,  
PhD**

[webpage](#)

Dr. Narendranath joins the Department of Mechanical Engineering-Engineering Mechanics as a lecturer. He previously was a visiting assistant professor. Aneet has a PhD in Mechanical Engineering-Engineering Mechanics from Michigan Tech. He held numerous leadership roles at Michigan Tech while a graduate student, including secretary of the Daniell Heights Apartment Council and president of the Indian Students Association. He belongs to the American Society of Mechanical Engineers and the American Physical Society.



**Ye (Sarah)  
Sun, PhD**

[webpage](#)

Dr. Sun joins the Department of Mechanical Engineering-Engineering Mechanics as an assistant professor. Sun comes to Michigan Tech from Case Western Reserve University. She received a PhD in Electrical Engineering from Case Western Reserve University and a bachelor's in precise instrumentation of measurement and control from Tianjin University. Sarah has worked on two National Science Foundation projects. She is a member of the IEEE, the American Society of Mechanical Engineers and the International Society of Optical Engineering.



**Radheshyam  
Tewari, PhD**

[webpage](#)

Dr. Tewari joins the Department of Mechanical Engineering-Engineering Mechanics as a lecturer. Previously, Tewari was an instructor at Michigan Tech. Radheshyam received two degrees from Michigan Tech, an MS and a PhD in Mechanical Engineering, and holds a bachelor's in mechanical engineering from Maulana Azad National Institute of Technology in India. He has three years of industry experience in machining processes, production planning, quality engineering and total productive maintenance. Radheshyam also has research experience using semiconductor fabrication and metrology tools for micro/nano-manufacturing.



### Current Contracts and Grants

**Ossama Abdelkhalik** (PI, ME-EM); 'Trajectory Analysis for NASA Asteroid Redirect Mission'; sponsor: Exo Terra Resources LLC; total award amount: \$10,256.



**Jason Blough** (PI, ME-EM), **Jim DeClerck & Charles Van Karsen** (co-PIs, ME-EM); 'Understanding the Cavity Mode of Tires'; sponsor: Ford Motor Company; total award amount: \$64,000.



**Paul Dice** (PI, ME-EM), **Jeffrey Naber** (co-PI, ME-EM); 'Off-Highway Tire Drop Testing for Titan Tire'; sponsor: Titan Tire Corporation; total award amount: \$19,379.



**William Endres** (PI, ME-EM); 'Fuze Testing Capability Development'; sponsor: Air Force Research Lab; total award amount: \$332,172.



**L. Brad King** (PI, ME-EM); 'Characterization Test-bed for Nanostructured Propellants'; sponsor: Air Force Office of Scientific Research; total award amount: \$456,539.



**L. Brad King** (PI, ME-EM); 'Electrospray from Magneto-Electrostatic Instabilities'; sponsor: US Department of Defense - Air Force Office of Scientific Research; total award amount: \$745,578.



**Nina Mahmoudian** (PI, ME-EM); 'Analysis of Mobile Haulage Equipment Operation Dynamics'; sponsor: National Institute for Occupational Safety & Health - Office of Mine Safety and Health; total award amount: \$24,000.



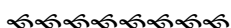
**Nina Mahmoudian** (PI, ME-EM), **Michele Miller & Mohammad Rastgaar** (co-PIs, ME-EM); 'NRI: Co-Robots to Engage Next Generation of Students in STEM Learning'; sponsor: National Science Foundation; total award amount: \$403,308.



**Jeffrey Naber** (PI, ME-EM); 'Testing and Analysis on a Single Cylinder DI SI Engine for Injector Evaluation and validation with Exhaust Gas Analysis'; sponsor: Nostrum Energy, LLC; total award amount: \$71,390.



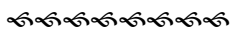
**Gregory Odegard** (PI, ME-EM), **Jeffrey Naber & Jeremy Worm** (co-PIs, ME-EM), **Paul Sanders** (co-PI, MSE); 'Development of Conformable CNG Tanks for Automotive Development'; sponsor: Southwestern Energy; total award amount: \$2,107,965.



**Mohammad Rastgaar Aagaah** (PI, ME-EM); 'CAREER: Steerable Powered Ankle-foot Prostheses for Increased Mobility in Amputees'; sponsor: National Science Foundation; total award amount \$640,412.



**Mahdi Shahbakhti** (PI, ME-EM); 'GOALI: Collaborative Research: Easily Verifiable Controller Design'; sponsor: National Science Foundation; total award amount: \$198,390.



**Reza Shahbazian Yassar** (PI, ME-EM), **Tolou Shokuhfar** (coPI, ME-EM) **Yoke Kin Yap & Cludio Mazzoleni** (co-PIs, Physics), **Stephen Hackney** (coPI, MSE); 'MRI: Acquisition of a High Resolution transmission Electron microscope for In Situ Microscopy Research and Education'; sponsor: National Science Foundation; total award amount: \$1,736,592.



**Reza Shahbazian Yassar** (PI, ME-

EM), **Tolou Shokuhfar** (co-PI, ME-EM); 'Fundamental Understanding on the Role of Structural Defects on Lithiation of Nanoscale Transition Metal Oxides'; sponsor: National Science Foundation; total award amount: \$445,658.



**Tolou Shokuhfar** (PI, ME-EM); 'CAREER: A New Perspective on Biomineralization in Healthy Dysfunctional Ferritins'; sponsor: National Science Foundation; total award amount: \$554,593.



**Tolou Shokuhfar** (PI, ME-EM); 'In Situ Liquid Microscopy of Biological Materials'; sponsor: Pacific Northwest National Laboratory; total award amount: \$44,378.



**Jeremy Worm** (PI, ME-EM); 'HEV and EV Hand-On Education for the 2014 Calendar Year'; sponsor: Ford Motor Company; total award amount: \$34,731.



**Jeremy Worm** (PI, ME-EM); 'Raising Awareness to the Need for Growth in Engineering Talent in Michigan and the training Assets Available at the 2014 CAR Conference'; sponsor: Michigan Economic Development Corporation; total award amount: \$12,810.



**Jeremy Worm** (PI, ME-EM); 'Providing Hands-On STEM Education at the 2014 Heroes Alliance Young Urban Intellectual Summit'; sponsor: National Center for the Advancement of STEM Education (nCSE); total award amount: \$8,279.



**Jeremy Worm** (PI, ME-EM); 'Thermal Modeling of a Prototype Hybrid Electric Military HMMWV'; sponsor: ThermoAnalytics, Inc.; total award amount: \$5,118.

# CAPSTONE

# ORNER

## 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 Competitions and Team Awards

The MTU Space Trajectory Optimization Team was ranked 20 in the 7th Global Trajectory Optimization Competition. There were 38 teams worldwide participating in the competition sponsored by the European Space Agency (ESA). "The Global Trajectory Optimization Competition is an event taking place every one-two years over roughly one month during which the best aerospace engineers and mathematicians world wide challenge themselves to solve a "nearly-impossible" problem of interplanetary trajectory design. The problem

is released by the winning team of the previous edition who, also, is free to define entirely the competition rules."



The team consists of Ehsan Taheri, Shangyan Zou, Brandon Jackson, and Jonathan Curtis (all PhD students, ME-EM). Their faculty advisor is **Dr. Ossama Abdelkhalik** (assistant professor, ME-EM).

### Faculty & Staff Awards & Accomplishments

**Nancy Barr** ( senior design and technical communications advisor, ME-EM) was interviewed by Motown Writers Network. See the interview at [Motown](#).

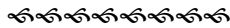


**Dr. Dana Johnson** (professor, SBE; adjunct professor, ME-EM) has entered into an agreement with Portage Health. Business and engineering students from her Six Sigma and Quality Engineering courses will be working with Portage Health's rehabilitation and sports medicine department to solve real world problems. Read the article at [health](#).



## Faculty & Staff Awards & Accomplishments continued

**Dr. James DeClerck's** (professor of practice, ME-EM) Canvas course MEEM3502 was a winner of the CTL's Creative Canvas Course Contest (C4). It was first nominated by students, then selected after review, to be the winner.



*Pictured left to right Daryl Bennett, Dr. Nina Mahmoudian, and Barzin Moridian*

A feature article about **Dr. Nina Mahmoudian's** (assistant professor, ME-EM) research printed in Michigan Tech's daily news Tech Today was picked up and published nationally by [Science World Report](#), [interference technology](#), [Phys.org](#), [Communications ACM](#), [Nano werk](#), [News Locker](#), [Gizmag.com](#), [Mashable](#), [redOrbit](#), [ScienceDaily](#), and [Inside Towers](#) to name a few.

The North Carolina State MAE News magazine published an article about **Professor Michele Miller** (ME-EM) and her current research at Michigan Tech.



**Jaclyn (Nesbitt) Johnson** (lecturer, research assistant professor, ME-EM) was featured in an interview at Michigan Tech's Advanced Power Systems Research Center on PowerNation: Engine Power, a cable TV program that aired on CBS Sports Network and Spike TV. Her interview starts at 16:00 minutes into the program. [PowerNation](#).

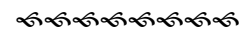


**Dr. Gordon G. Parker** (professor & John and Cathi Drake Chair Professor, ME-EM), has been elected Fellow of the Society of Automotive Engineers (SAE). Dr. Parker will be honored during the SAE 2014 World Congress and Exhibition in Detroit, MI, the week of April 20, 2015. Dr. Parker is being honored as a recognized international leader in control system design research in a variety of mobility-related applications from diesel engine exhaust aftertreatment to satellite for-

mation flying.



**Dr. Reza Shahbazian Yassar** (associate professor, ME-EM) headed a team of researchers that have been successful in securing the funding to purchase a \$1.7M, state-of-the-science transmission electron microscope (TEM). The TEM would support a range of research projects at Michigan Tech. Read the article at [TEM](#).



**William W. Predebon** (professor and Department Chair, ME-EM) was a panelist on the ASME panel for Advanced Manufacturing: A New Industrial Revolution. See the video at: [ASME](#).



**Dr. William W. Predebon** has been awarded the Dedicated Service Award by the American Society of Mechanical Engineers. The award honors unusual dedicated voluntary service to the Society marked by outstanding performance, demonstrated effective leadership, prolonged and committed service, devotion, enthusiasm and faithfulness.



The new **Active Learning Center** located in the old "fishbowl" is now completed. It has been completely transformed into a technology-rich collaborative learning space, featuring 72 student computer stations, three instructor stations and 29 collaboration LCD monitors hung from the ceiling. Unlike the traditional learning space, the "front" of the classroom has been eliminated, allowing faculty to facilitate both heads-down concentration work and group collaboration, as well as provide hands-on technology for their students. In addition, when this room is not scheduled for classes, it will be available to all students as a computer lab.



totalled 474, nearly 7 percent of the student body and another all-time high. Graduate School enrollment is 1,442 or 20 percent of the student body. Michigan Tech's 1,093 international students represent another all-time high. Retention—the percentage of first-year students who return for their second year—was 85 percent, the highest it has been since 1993.

The only Michigan school ranked higher was University of Michigan, at 22nd nationwide. See the articles at [MLive](#).



A Payscale survey lists Michigan Tech third in the nation among public research universities for the average starting salary for graduates. The complete story is located at [Payscale](#). See the survey at [survey](#).

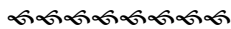


Michigan Tech ranked 56th of 170 public universities (in the top third) in the annual US News & World Report ranking of the best undergraduate colleges and universities. Michigan Tech's undergraduate engineering programs ranked in the top half nationwide, 73rd of 157 programs.



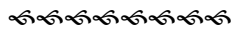
### University News/Awards

For the third year in a row, Michigan Tech has received the Higher Education Excellence in Diversity (HEED) award from INSIGHT Into Diversity magazine. The HEED award recognizes US colleges and universities that demonstrate an outstanding commitment to diversity. Michigan Tech will be featured along with 82 other award-winning institutions in the magazine's November 2014 issue.



According to Michigan Tech's preliminary fall enrollment figures fall enrollment totaled 7,100. This was up from last year and the second highest since 1983. Other enrollment data include Female enrollment in the College of Engineering was 1,005, an all-time high at 22 percent. American minority students

Michigan Tech finished the fiscal year with a positive balance in its Current Fund according to the treasurer's report at the August 7, 2014 report to the Michigan Tech Board of Control. The Current Fund includes the General, Designated, Auxiliary, Retirement and Insurance and Expendable Restricted Funds. Michigan Tech surpassed its fundraising goal for the fiscal year ended in July 2014.

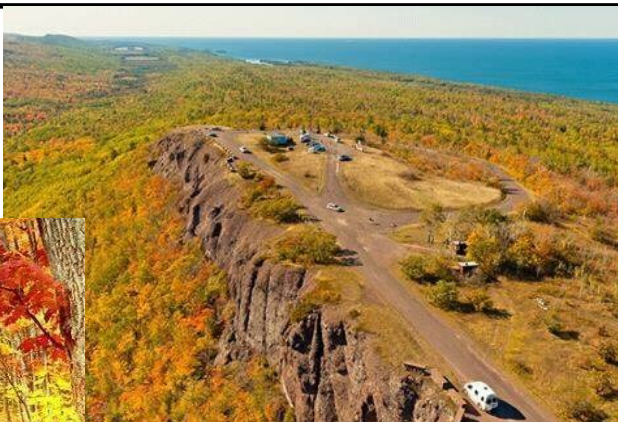


MLive, a Michigan news network based in Lansing, reported on Money magazine's latest rankings of the best colleges in the US, based on graduation rate, cost and return on investment. Michigan Tech placed second-highest among Michigan institutions and 82nd in the nation.

College Week, a feature on the Thrillist website, named Michigan Tech as one of 10 colleges and universities with one of the most unusual perks. In Tech's case it was Mont Ripley, the Michigan Tech ski hill. [Ripley](#).

### Area News

Houghton was ranked 15th out of the 16 Greatest Places to Live in America by Outside magazine. See the rankings at [Houghton](#).



*Photos courtesy of Ginny Miracle*



**Happy Halloween  
from all of us at  
ME-EM**