ME-EM eNewsBrief, September 2018

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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Upcoming Events
ME-EM Academy Induction Ceremony
On Saturday, October 20, the Academy of Mechanical Engineering and Engineering Mechanics will induct two new members: Dr. Tony N. Altobelli, BSME ‘86 and Mr. Brian J. Krinock, BSME and BS Mining Engineering ‘85. The ME-EM Academy honors outstanding ME graduates and recognizes excellence and leadership in engineering and civic affairs.

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.

Past Events
The MTU Presidential Council of Alumnae (PCA) held an induction ceremony on September 20 to recognize 13 new members and honor them for their personal and professional achievements in education, career excellence, community involvement and volunteerism as a MTU student or alumna. Congratulations to the ME-EM inductees honored at this event including:

* Joan M. Heil, BSME ‘83
* Brenda M. Moyer, BSME ‘84
* Heidi A. Mueller, BSME ‘93
* Jennifer J. Shute, BSME ‘96

One hundred twenty eight alumni, their families, friends, faculty and staff enjoyed the Annual ME-EM Alumni Scholarship boat cruise on the Portage Canal during the 2018 Alumni Reunion on August 2. The weather held and the sun did shine upon those aboard who helped to raise $1,300 for the scholarship.

Greetings from Dr. William (Bill) Predebon, J.S. Endowed Dept. Chair & Professor, Dept. of Mechanical Engineering - Engineering Mechanics at Michigan Tech. For your convenience, we have bolded the names of all ME-EM alumni, students, faculty and staff in the eNewsBrief. For the latest news and info about our faculty, students and staff, please visit our website at www.mtu.edu/mechanical, and visit us on Facebook, MEEM and Twitter.
We are happy to introduce the newest additions and promotions to the ME-EM department’s faculty and staff:

**Dr. Cameron M. Hadden** (Biomed '08, ME-EM PhD '14) joined the ME-EM faculty this fall as a Lecturer. Prior to joining the faculty, Dr. Hadden worked as an Optimization Engineer in Energy Savings and Process Improvement with Boise Paper, Inc. He has served as a temporary Instructor for the ME-EM department since 2014.

**Rachel A. Hook** (BSME '16, MSME '17) joins the ME-EM department as a Research Engineer/Scientist. She came to us from Milwaukee Tool where she worked as a Tool Quality Engineer. Rachel’s responsibilities will include planning and developing educational materials and other resources for teaching of undergraduate lab courses in mechanical design and manufacturing processes, including in the SCD program.

**Jon Lund** (AAS EET ‘82), formerly a Machine Shop Attendant at the Advanced Technology Development Center (ATDC), joins the ME-EM department as a Senior Capstone Design Training Specialist. Jon has been employed at MTU for five years and has trained and assisted the Advanced Motor Sports Enterprise teams on the safe and proper use of CNC lathes and mills. He assisted teams with test engines, layup composites and build cars. Prior to his time at MTU, Jon worked for 12 years with DP Construction in Chassell.

**Dr. Steven Ma** joined the ME-EM faculty this fall as a Professor of Practice. Dr. Ma received his B.S in Aerospace Engineering from the Beijing University of Aeronautics & Astronautics in 1983, his M.S. in Mechanical Engineering from Beijing Polytechnic Univ. in 1986, and his PhD in Mechanical & Aerospace Eng. with a concentration in Structural Dynamics from State University of New York at Buffalo, Buffalo, NY in 1991. Dr. Ma also received an Executive MBA from Tsinghua University, China in 2011. Dr. Ma has had a 24 year career in industry and an extensive background of technical and commercial experience in product and market development of construction, mining, oil & gas and industrial equipment.

**Dr. Jeremy Worm** (BSME ‘99, MSME ‘12, PhD ME-EM ‘17) has been promoted to Associate Director of the APSRC (APS LABS). He was the Center's first staff hire in 2007 and has been instrumental in development and expansion of the Center including development of the APSRC building, in building partnerships with industry, and in operation & direction of the Mobile Lab.

**RETIREMENTS**

As of October 1, **Chuck Van Karsen**, associate professor, has officially retired after teaching for 31 years with the department.

**Dr. John Beard**, associate professor, has announced that he will retire after Fall semester classes end. Dr. Beard has been teaching with the department since 1992.

**Faculty/Staff Awards/ Accomplishments**

**Dr. Andrew Barnard** (assistant professor, ME-EM) & **Steven Senczyszyn** (BSME ‘16, MSME ‘18) joined forces with Great Lakes Sound & Vibration to create an active noise control system using carbon nanotubes to shush loud HVAC systems. Read the story on Unscripted

**Dr. Nancy Barr** (Director, Engineering Communications, ME-EM) recently presented a paper titled, "Helpful,' 'Irritating,' and 'Smart,': Student Perspectives on Teams in a Mechanical Engineering Program," at the annual conference of the IEEE Professional Communication Society in Toronto, Ontario. The paper, co-authored by **Dr. Jim DeClerck** (professor of practice, ME-EM), highlighted three problems that commonly hinder undergraduate engineering teams and suggested possible solutions. Barr was also co-chair of the proceedings committee for the conference.

**Dr. Nancy Barr** also presented, "Timing is Everything: Strategies for Avoiding the Temptation to Plagiarize" at the ME-EM Graduate Seminar Speaker Series held Sept. 13. Dr. Barr has developed a multi-faceted technical communications program in the ME-EM department at Michigan Tech.
Faculty/Staff Awards/Accomplishments (cont.)

The SAE John Johnson Award for Outstanding Research in Diesel Engines goes to David E. Foster, PhD, an internationally renowned consultant on engine combustion processes, emissions control and efficiency improvements. This award is funded through generous contributions from Dr. John H. Johnson (research and professor emeritus, ME-EM) his colleagues and former students. Read the announcement on the U WI-Madison CoE page.

Dr. L. Brad King (professor, ME-EM) authored the article “Space tech has outpaced space law, and we’re at risk of killing innovation,” as seen in techrunch.com.

Dr. Guy Meadows (GLRC) was referenced in the story "Line 5 spill could drown old record," in the Traverse City Record Eagle. Meadows led a team that looked at a "worst case scenario" spill or release from the Enbridge Line 5 pipeline that runs beneath the Straits of Mackinac. The story was covered extensively by regional media including the Detroit News, WLUC TV6, WMJNTB3, MITECHNEWS, Thumbnet, Michigan Radio and MLive.

Drs. Guy Meadows (ME-EM and GLRC) and Roman Sidortsov (SS) were cited in the article “Women in Automotive Engineering (WIAE) summer youth program, led by Chris Morgan, (Manager, Mobile Lab, ME-EM). ME alumnus Cynthia Hodges (BSME ’87, MSME ’90) is also mentioned in the article “Michigan Tech Drives Girls to Explore Automotive Engineering”.

Dr. Gregory Odegard (professor, ME-EM) was quoted in the story "Bacteria could help build Mars habitats,” in New Scientist.

Dr. Mo Rastgaar’s (associate professor, ME-EM) drone catcher was mentioned in Forbes in a PlanetM article “The Drone Catcher: How A Michigan Robotics Lab Hopes to Keep the Skies Friendly”.

Dr. Paul van Susante (senior lecturer, ME-EM), serving as a subject matter expert in systems and civil engineering, was part of the team that placed second in the NASA 3D-printed Habitat Centennial Challenge competition geared toward creating a future home on Mars. Read more the NASA article and view the virtual model YouTube video and AI team website.

Alumni & Friends News, Accomplishments & Awards

Curtis Fortier (BSME ’91, MSME ’94) was featured in the Michigan Tech Alumni and Friends Blog explaining why he chose Michigan Tech. Read the article here.

John Hallquist (MSME ’72, PhD ’74) was featured in the article “Celebrated for Innovations in Software Development,” in Benzinga.

Joe Hernandez (BSME ’06, MSME ’08, PhD ’14) is running as a candidate for Woodbury, Minnesota Mayor. Best wishes for a successful campaign.

Michigan Tech alumnus Greg Ives (BSME ’03) was featured in the story "U.P. native serves as crew chief for Hendrick Motorsports," on ABC 10.

The U.S. Nuclear Regulatory Commission has selected Michigan Tech alumnus Paul LaFlame (BSME ’02) as the new senior resident inspector at the Palisades nuclear power plant in South Haven, Michigan. The story was covered in PublicNow.com.

Michigan Tech alumnus Duane Rondeau (BSME ’88), has been promoted to executive director of sales - masonry and hardscape at Besser Co. The story was covered in Concrete Products.
Student Accomplishments & Awards

Five Michigan Tech MS ME-EM students, Manoj Balabadhruni, Karan Gundre, Aniket Maruti Jadhav, Akhilesh Arun Jadhav and Mayuresh Pandharinath Kange attended the PACE forum and training at GM’s Tech Center in Warren, MI in mid-July. Here is a summary of the awards that TEAM 3, of which MTU is a part of, has won:

- 1st - Manufacturing Engineering
- 2nd - Product Engineering
- 3rd - Customer Insight, & Siemens Award for Excellence in PLM.

Read the article in TechToday.


Michigan Tech, with the SAE/GM AutoDrive Competition Vehicle, is featured on SAE Update magazine - fantastic. Congratulations to the team and their co-advisors Dr. Jeremy Bos (assistant professor, ECE) and Dr. Darrell Robinette (assistant professor, ME-EM). MTU's AutoDrive Chevy Bolt with two graduate students, Derek and Joe, was the cover photo of SAE’s International Update.

University News

The Michigan Tech community is mourning the death of Dr. Raymond L. Smith, Michigan Tech’s president from 1965 to 1979. Dr. Smith passed away peacefully on Sept. 18, at his home in Green Valley, Arizona. He was 101.

During his tenure as the sixth president at Michigan Tech, enrollment increased from 3,400 to 7,600 students, faculty numbers neared the 300 mark, research funding increased by 250%, lab equipment and computer facilities were improved, and several new buildings were built, including the one that bears his name, the R.L. Smith building (aka the MEEM). For more detail read the article on the Michigan Tech News webpage.

Michigan Tech was mentioned in the story “DOE awards Hyundai $4.95M for work on advanced mixed-mode gasoline engine: Co-Optima,” in Green Car Congress. The article is about a Dept. of Energy grant to study mixed mode engine technology. The project is a collaboration between Hyundai, Phillips 66 and Michigan Tech.

MSN included Michigan Tech in their “Best Colleges for Seniors in Every State” list noting that Michigan Tech waives tuition and related fees for up to two courses per semester for students 60 and older.

Michigan Tech’s Autonomous Off-Roading research is noted in Forbes.com PlanetMVoice: Michigan’s Robotic Car Researchers are Making Science Fiction a Reality

Michigan Tech was on the list of the Best 50 US Colleges for your money as compiled by Business Insider. The story was covered by national and international media including Business Insider India, Eveyo and Business Insider Nordic.

MichiganTech once again appears on @MONEY magazine's list of "Best Colleges for your Money." Tech comes in at 112 out of 727 public and private universities. Among the nation's public universities, Tech was ranked #63!
Bar-Ziv, Ezra (PI, ME-EM), Andre Da Costa (Co-PI, Chem Eng); “Bio-Oil as a Feedstock in a Petroleum Refinery”; sponsor: Michigan State University; total award: $25,000.

Barnard, Andrew (PI, ME-EM); “Review of the State-of-the-Art in Carbon Nanotube Loudspeakers”, sponsor: Tenneco, GmbH; total award: $14,540.

Barnard, Andrew (PI, ME-EM), Jim Baker (Co-PI, IIE); “Technology Transfer Talent Network (T3N)”; sponsor: University of Michigan; total award: $25,000.

Barnard, Andrew (PI, ME-EM); “Multiphysics Modeling of Carbon Nanotube Coaxial Speakers in Vehicle Exhaust”; sponsor: Ford Motor Company; total award: $30,000.

Barnard, Andrew (PI, ME-EM); “Development of a Complimentary Method for IIC Testing of Floor Assemblies”; sponsor: GrassWorx, LLC; total award: $36,511.

Barnard, Andrew (PI, ME-EM); “HDD Noise Testing for Fire Protection Systems”; sponsor: Johnson Controls, Inc.; total award: $4,084.

Barnard, Andrew (PI, ME-EM); “ONR Graduate Traineeship Award: Multi-modal, Near-shore, Ice-covered Arctic Acoustic Propagation Measurements and Analysis”; sponsor: Office of Naval Research; total award: $59,405.

Blough, Jason (PI, ME-EM), De Clerck, Jim (Co-PI, ME-EM), Van Karsen, Chuck (Co-PI, ME-EM); “Multi-Axis Resonant Fixture Shock”; sponsor: Honeywell Federal Manufacturing & Technologies, LLC; total award: $124,000.

Blough, Jason (PI, ME-EM), Barnard, Andrew (Co-PI, ME-EM); “Frequency Response Inspection of Additively Manufactured Parts”; sponsor: Honeywell Federal Manufacturing & Technologies, LLC; total award: $102,300.

Blough, Jason (PI, ME-EM), De Clerck, Jim (Co-PI, ME-EM), Van Karsen, Chuck (Co-PI, ME-EM); “Fixture Design and Damage Potential”; sponsor: Honeywell Federal Manufacturing & Technologies, LLC; total award: $60,000.

Naber, Jeffrey (PI, ME-EM), Shahbakti, Mahdi (Co-PI, ME-EM); “High Engine Speed Cranking and Individual Combustion Control for Reduced Cold Start Emissions”; sponsor: Ford Motor Company; total award: $200,000.

Naber, Jeffrey (PI, ME-EM), Morgan, Chris (Co-PI, ME-EM), Shahbakti, Mahdi (Co-PI, ME-EM); “Development, Validation and Integration Support for a HIL VD&PT Vehicle Model”; sponsor: Hitachi America, Ltd.; total award: $59,600.

Naber, Jeffrey (PI, ME-EM), Atkinson, Bill (Co-PI, ME-EM), Lee, Seong-Young (Co-PI, ME-EM), Schmidt, Henry (Co-PI, ME-EM); “Investigation of Injection and Spray Characteristics for Two HD Diesel Injectors”; sponsor: PACCAR, Inc.; total award: $49,756.

Parker, Gordon (PI, ME-EM), Weaver, Wayne (Co-PI, ECE); “Real-Time Simulator for Advanced Energy Network Planning Optimization”; sponsor: US Department of Defense, Office of Naval Research; total award: $200,000.


Ra, Youngchul (PI, ME-EM); “Development and Application of Fuel Surrogate and Chemical Kinetics Model for PACCAR Truck Engine Simulation”; sponsor: PACCAR, Inc.; total award: $49,000.


Robinette, Darrell (PI, ME-EM), Blough, Jason (Co-PI, ME-EM), Shahbakti, Mahdi (Co-PI, ME-EM); “Improved Clunk Parametrization and Rig Development”; sponsor: Ford Motor Company; total award: $200,000.

Robinette, Darrell (PI, ME-EM); “Robust Terrain Identification and Path Planning for Autonomous Ground Vehicles in Unstructured Environments”; sponsor: University of Michigan; total award: $91,964.

Robinette, Darrell (PI, ME-EM); “Rear Drive Automatic Transmission System Sensitivity Modeling and Synthesis”; sponsor: General Motors Company; total award: $93,072.

Robinette, Darrell (PI, ME-EM), Morgan, Chris (Co-PI, ME-EM), Worm, Jeremy (Co-PI, ME-EM); “Delivery of Professional Development Modules in Propulsion Systems”; sponsor: Borg Warner; total award: $42,000.
Current Contracts & Grants

Schmidt, Henry (PI, ME-EM), Atkinson, Bill (Co-PI, ME-EM), Lee, Seong-Young (Co-PI, ME-EM), Naber, Jeffrey (Co-PI, ME-EM); “Investigation of Injection Spray Characteristics and Combustion for One LD Gas Direct Injector”; sponsor: Aramco Service Company; total award: $46,983.

Shahbakhti, Mahdi (PI, ME-EM), Blough, Jason (Co-PI, ME-EM), Robinette, Darrell (Co-PI, ME-EM); “Improved Driveline Torque Shaping: Controls and Calibration”; sponsor: Ford Motor Company; total award: $200,000.

Shahbakhti, Mahdi (PI, ME-EM), Naber, Jeffrey (Co-PI, ME-EM); “Control-Oriented Modeling and Predictive Control of Advanced Dual Fuel Natural Gas Engines”; sponsor: National Science Foundation; total award: $269,976.

Sun, Ye (PI, ME-EM); “CAREER: System-on-Cloth: A Cloud Manufacturing Framework for Embroidered Wearable Electronics”; sponsor: National Science Foundation; total award: $350,000.

Department Accomplishments

ME-EM Among Nation's Leaders in Enrollment and Degrees Awarded

Michigan Tech's Department of Mechanical Engineering-Engineering Mechanics continues to be ranked among the nation's leaders. ASEE ranks universities in terms of engineering enrollment and in the number of undergraduate and graduate engineering degrees awarded. Michigan Tech's ME-EM department ranks in the top ten nationally in bachelor’s enrollment, master’s enrollment and degrees, and in the top 25 in PhD enrollment. Read the full article in Tech-Today.

Senior Capstone Design Update

Our fall semester is nicely underway with 19 new SCD projects launched. Thanks to all those who stepped up to get involved this year. We needed it! Those 19 along with the 16 projects continuing from their January start makes a total of 35 projects in 2018.

A special thanks to our External Advisory Board members, who will be coming to Tech for their biannual meeting as this goes to press.

We have a 26% participation rate from our EAB in sponsoring SCD projects, as seven of the twenty seven organizations represented in our EAB are involved in projects this year. A couple of these organizations are backing multiple projects. You know who you are, and THANKS!

Of the 35 projects currently underway, 13 of these came from organizations represented in our EAB.

We are already planning for our next group of projects, beginning in just four months. Student SCD registration for next year - both spring and fall semesters - are expected to be equal to or greater than 2018, which translates roughly into 40 projects needed in 2019.

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