ME-EM eNewsBrief, September 2019

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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Greetings from Dr. William (Bill) Predebon, J.S. Endowed Department Chair and Professor, 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

ME Scholarship Winter Carnival Alumni Hockey Social will be held on Saturday, February 8, 2020 during the Michigan Tech vs. Lake Superior State hockey game in the Husky Suite South Skybox of the John MacInnes Student Ice Arena. The game has a 5:07 p.m. start time. Tickets are $30/person, which includes a $15 donation to the ME-EM Alumni Scholarship Fund. Stadium food and refreshments are provided by the ME-EM department. A registration link will be posted on the Michigan Tech website later this year for more info and to purchase tickets for this fun-filled event. Contact Alumni Services office (906) 487-2400.

SAE Clean Snowmobile Challenge - March 9-14, 2020 - hosted by the Keweenaw Research Center and the ME-EM department for the past 17 years. Next year will be the 20th anniversary of the CSC competition. If you are interested in becoming a CSC 2020 sponsor, please contact Jay Meldrum at 906-487-2750, or email jmeldrum@mtu.edu

Past Events

Dynamic Systems Lab (DSL) Reunion
Past and present members of the DSL and their families gathered on the waterfront at the Houghton Pavilion this summer to enjoy a beautiful day, a summer’s feast and to reminisce and celebrate. Some say the stories lasted well into the evening hours, and the group may have wound up at the Ambo later that night.

ME-EM Department Chair Travel
When traveling for the department, Dr. Predebon enjoys visiting with ME alumni to hear stories from their time at Tech and how their education guided their career path. Bill also hopes to gather feedback on our current programs. Let us know if you might be available for a visit when he is in your area. Contact the department at (906) 487-2911.

November 8-14, 2019 - Salt Lake City, UT
ASME - IMECE International Mechanical Engineering Congress and Exposition
April 22-25, 2020 - Detroit, MI
SAE World Congress

Good times were had at the Dynamic Systems Lab reunion in July!
ME-EM Department - New Faculty

We are happy to introduce the newest additions to the ME-EM department’s faculty:

**Dr. Jung Yun Bae** joined the ME-EM faculty this fall as an Assistant Professor. Dr. Bae received her BS and MS from Hongik University in Seoul, Korea in 2005 and 2007 respectively, and her PhD in Mechanical Engineering from Texas A&M University in 2014. Upon receiving her PhD degree, Dr. Bae served as a Research Professor in the Intelligent Systems and Robotics Laboratory at Korea University, Seoul, Korea from 2014-2015 and from 2018-2019. Dr. Bae’s research strengths lie in robotics and optimization.

**Dr. Susanta Ghosh** continues his career with the department as an Assistant Professor. Dr. Ghosh received his BSE in Civil Engineering from the Indian Institute of Science & Technology, and both his MSc in Engineering in 2003, and his PhD in Civil Engineering, from the Indian Institute of Science, Bangalore in 2008. He did postdoctoral work with Duke Univ, the Univ of Michigan and the Technical Univ of Catalonia, Barcelona; then served as a Res Asst Professor with ME-EM from 2015-19. Dr. Ghosh’s areas of research include computational science & atomistic-continuum material modeling utilizing data-driven analysis and machine learning.

**Dr. Sriram Malladi** joined the ME-EM department as an Assistant Professor. Dr. Malladi received his BTech in Mining Machinery Engineering from IIT Dhanbad, India in 2011, and both his MS and PhD in Mechanical Engineering from Virginia Tech in 2013 and 2016 respectively. Dr. Malladi came to us from Virginia Tech’s Vibrations, Adaptive Structures and Testing (VAST) Lab where he worked as a Research Scientist from 2016-19. Dr. Malladi’s research interests include structural dynamics and adaptive systems and instrumented structures utilizing data-driven analysis and machine learning.

**Dr. Myoungkuk Park** joined the ME-EM department as a Research Assistant Professor. He received his BS in Mechanical Engineering from Kyunghee Univ in Seoul, Korea in 2002, his MS in Mechanical Engineering from Korea Univ in 2004, and his PhD in Mechanical Engineering from Texas A&M University in 2014. Before joining the department, Dr. Park worked in industry as a Senior, then Principal, Engineer for several years at Samsung Electronics in Asan, Korea. His areas of expertise include smart factory / manufacturing automation and mobile robots.

**Dr. Paul van Susante** continues his career in the department as an Assistant Professor. He received a BS and MS in Civil Engineering from TU-Delft, the Netherlands in 2001, and his MS and PhD in Engineering Systems from the Colorado School of Mines in 2004 and 2011 respectively. Upon receiving his PhD, Dr. van Susante served as an Adj Instructor with the Colorado School of Mines, Division of Engineering; then taught in the ME-EM dept as a Lecturer from 2012-15, and as a Senior Lecturer from 2015-19. His areas of research includes in-situ resource utilization and soil machine interaction in deep space.

**Dr. Yongchao Yang** joined the ME-EM department as an Assistant Professor. He received his BS in Structural Engineering from Harbin Institute of Technology, Harbin, China in 2010, and his PhD in Structural Engineering from Rice University in 2014. Dr. Yang came to us from Argonne National Laboratory where he worked as a Technical Staff Member from 2018 to 2019, and he also served as a Director’s Postdoctoral Fellow at Los Alamos National Laboratory from 2015-17. His research strengths lie in structural dynamics, computer vision, and physics-informed deep learning.

**Post Doctoral Scholars**

**Dr. Shirin Jouzdani** will be working with Dr. Jeff Naber in support of the research associated with combustion and engine studies including experimental studies in the spray and combustion, and engine labs. Dr. Jouzdani received her PhD in Mechanical and Aerospace Engineering from Syracuse University in 2018.

**Dr. Stas Zinchik** will continue his work with Dr. Ezra Bar-Ziv after earning his PhD in Mechanical Engineering here at Michigan Tech. Dr. Zinchik will be doing research in the area of Torrefaction and Pyrolysis in support of Dr. Bar-Ziv’s research program.

**Dr. Rongpan Hu** will join the department in October to begin work with Dr. Yongchao Yang in his research involving deep learning for systems identification and control, sensor network optimization. Dr. Hu received his PhD in Structural Engineering at the Hong Kong Polytechnic University.

**Dr. Shanwu Li** will also join Dr. Yongchao Yang’s lab to support his research in the area of computer modeling, simulation and processing for dynamical system analysis, identification and control. Dr. Li received his PhD in Civil Engineering at Harbin Institute of Technology in China.
New ME-EM Department Staff

Jamie Schultz joined the department office staff in September as an Administrative Aide. Jamie transferred in from MTU Chem Stores and has held several other positions outside of the university. She brings with her a dedicated and customer-focused approach and we are delighted to welcome her to the team.

Alumni & Friends News, Accomplishments & Awards

Phil Gable ('08) was featured in the article “FloraCraft announces leadership promotions for trio,” in the Ludington Daily News. Gable was promoted to Vice President of extrusion for FloraCraft of Ludington, Michigan.

Keith Forester ('86) was featured in the article "Lazydays Names Forester VP of Service Operations," in RVBusiness.

Karl Haapala, '01, 03 '08, was featured in the article "OSU Researchers Discuss Sustainability in Additive Manufacturing and New Sustainable Development Methodology," in AdditiveManufacturing.com.

Jason Markesino ('03) received Control Engineering’s 2019 Engineering Leader Under 40 award. Jason is an Engineering Manager at Applied Manufacturing Technologies. Jason has a BSME with Robotics and Automation Emphasis and has served as the lead electrical mentor of a FIRST Robotics Team since 2013.

Brenda Moyer ('85) was mentioned by an attendee of this year’s Summer Youth Program in MTU’s Unscripted Research blog. Brenda worked with the group on campus at the APS Labs as a representative of the WIE program’s sponsoring company, Dana Inc.

Brad Sankey ('97) was featured in Truck Trend Network for being one of the younger competitors at Diesel Power Challenge 2019. Brad is currently an engineer at Oshkosh Corporation.

ME-EM Faculty/Staff Awards/Accomplishments

Dr. Andrew Barnard ('02,'04) (associate professor) was featured in the Michigan Tech News article “Q&A with Teaching Award Winner Andrew Barnard” where he discusses his research, teaching style, inspirations and strategies in the classroom.

Dr. Barnard was also featured in the Michigan Tech News article “Q&A with Great Lakes Research Center's Andrew Barnard” which focuses on his new role as the director of the Great Lakes Research Center.

Dr. Nancy Barr (professor) was featured in the article “Divergent Courses: Preparing Graduate Students for Diverse Career Paths,” in July at the IEEE Professional Communication Society Conference in Aachen, Germany. Dr. Barr’s paper describes a two-course sequence in the ME-EM graduate engineering program that addresses the unique needs of students interested in either industry career paths or academia, regardless of language background.

Dr. Susanta Ghosh (assistant professor) was the focus of the MTU Unscripted Research Blog article “The Secret Strength of Gnashing Teeth” which talks about how the FEM and analytical microarchitecture modeling from Dr. Ghosh’s lab can help make ceramics, biomedical implants and the glass in buildings as tough as our teeth.

Dr. Ghosh was also the focus of a Michigan Tech story on the microarchitecture of brittle materials that was picked up by Super Computing Online and Science Daily.

Dr. Brad King (professor), and his small satellite technology company “Orbion Space Technology” were featured in an article in Crain’s Detroit Business that was picked up by several media outlets including boomerangcata-pult.com, and Space-news.com. An article also appeared in Forbes called “Thruster Tech Company Attracts $9.2 Million From Series A Investors”.

Jeff Naber (professor) and director of the Advanced Power Systems Research Center, has been appointed as an associate member of the Department of Energy’s (DOE) USDRIVE Committee. Read more about this three year appointment in the ME-EM News.

Dr. Naber was also appointed to the Executive Committee of the Automotive Research Center (ARC) by the center’s director Bogdan Epureanu, also noted in the ME-EM News.

Dr. Bill Predebon (professor) and chair of the ME-EM department, traveled to Washington, D.C. last week to be inducted into The Pan American Academy of Engineering. The Academy honors the exceptional engineers, who, prestige of their profession, have contributed decisively to the progress of their country and continent. Read the article in the College of Engineering Blog.
Dr. Darrell Robinette, assistant professor (*04, *07) was honored by SAE International with a 2019 Forest R. McFarland Award. The award recognizes individuals for their outstanding, sustained contributions to support SAE engineering events. News of this honor made several media outlets including Renewable Energy World and Marketplace.

Dr. Jeremy Worm, Associate Director APSRC (*99, *12, *17) was mentioned in TV 6 news story for his new appointment to the Michigan Truck Safety Commission. An article also appears in the ME-EM News.

Student Competitions & Team Awards

Graduate students Salil Sule (ME-EM MS student) and Aliakssei Petsik (ECE) coauthored an article with Joshua Pearce (MSE/ECE) on an open source, completely 3D printable centrifuge. The article was published in Instruments.

Undergraduate students Matthew Reich (MSE) and Aubrey Woern (BSME ’19) and graduate student Nagendra Tanikella (MSE) coauthored an article with Joshua Pearce (MSE/ECE). The article is titled "Mechanical Properties and Applications of Recycled Polycarbonate Particle Material Extrusion-based Additive Manufacturing." It was published in Materials.

NEW ORLEANS, La. – The Michigan Tech men's and women's track & field teams both earned post season NCAA Division II team academic awards from the U.S. Track & Field and Cross Country Coaches Association (USTFCCA) on Monday. In addition, Liz Bloch, Emily Byrd, Emily Vigil (BSME ‘18, MSME ’19), and Clayton Sayen received USTFCCA All-Academic individual accolades.

Student Accomplishments & Awards

Marlo Schwartzfisher (so. ME-EM), was mentioned in an article that ran in the Petosky News-Review in July titled “Charlevoix robotics team conducts successful FIRST camp”.

MSE visiting scholar Svetlana Obydenkova (from KTH Royal Institute of Technology, Sweden), ME student Nicholas Anzalone (BSME ’19), and Joshua Pearce (MSE/ECE) were awarded the Outstanding Paper in the 2019 Emerald Literati Awards from the Journal of Enterpriseing Communities: People and Places in the Global Economy for their work on the use of distributed manufacturing for people living in rural communities. Their paper is available for free through open access for the next year.

ME-EM Dept Accomplishments

ME-EM Rankings on the Rise:

Our Undergraduate ME Program ranked 34th nationally by the 2020 U.S. News Best Undergraduate Mechanical Engineering Programs among all doctoral granting universities in the Top 10% of all ME programs in the United States.

Our ME program is ranked 16 out of 272 ME programs nationwide in 2019 by College Factual on average early-career and average mid-career earnings. This places Michigan Tech’s ME program in the top 10% of all ME programs in the country as reviewed by College Factual for value.

Our Graduate program is 58th nationally among the 181 (top 32%) doctoral granting ME departments in the U.S. as ranked in 2019 by the 2020 U.S. News: Best Graduate Schools.

Our department is 6th in MSME degrees awarded, 10th in MSME enrollment, 23rd in PhD enrollment, and 33rd in PhD degrees awarded in the U.S. (latest ASEE Data-2017)

The National Science Foundation (NSF) ranks ME in research expenditures at Michigan Tech 19th in FY2017 (latest rankings) with $15.278 Million among all ME programs in the U.S.

Our undergraduate program is currently 8th in enrollment and 27th in BSME degrees awarded in the U.S. (latest ASEE data-2017). We have been in the top 27 in BSME degrees awarded for the past 35 consecutive years.

University News & Awards

MTU and NW Michigan College to Create Engineering Pipeline

Michigan Tech University and Northwestern Michigan College (NMC) have formalized a new partnership designed to expedite degree completion for engineering students transferring to Michigan Tech from NMC. Under the 2+2 agreements, which take effect with the fall 2019 semester, engineering students will be able to complete their first two years of study at NMC and then transfer to Tech with junior status. Read the full story in the Michigan Tech News.

Dean Kamen visits Michigan Tech

The president of DEKA Research and Development and co-founder of the FIRST Robotics program, Dean Kamen, caused a stir by visiting Michigan Tech in September with his talent acquisition team to speak to and recruit engineering students, and meet with 18 U.P. middle and high school teams participating in the FIRST Robotics program. Read the articles in The Daily Mining Gazette, and in Michigan Tech’s College of Engineering Blog.

Dean Kamen speaks to FIRST Robotics teams in the Rozsa Center during his September visit to Tech.
University News & Awards

Michigan Tech is No. 8 of 50 US colleges that pay off the most, as tabulated by CNBC.

Online Graduate Engineering Programs, Certificates, & Course Offerings

Michigan Tech’s College of Engineering is expanding undergraduate and graduate online course offerings for students who are off campus. Learn more about what online programs are currently available and to apply for regular admissions or non-degree seeking graduate student status. Read the story in University News.

Michigan Tech Ranked Among Top Colleges with Highest ROI

The website Supermoney.com has included Michigan Tech on its list of the top 50 colleges with the highest return on investment (ROI). Tech was ranked #49 on the list of "Top Colleges with Highest ROI." See article in TechToday.

Outreach: Eighteen high school students from Detroit and across the Lower Peninsula spent six days at Michigan Tech in July to explore Natural Resources and Engineering majors and consider attending Michigan Tech. Read articles in TechToday and in the COE Blog.

Insider listed Michigan Tech as one of 11 schools with enticing perks because of Mont Ripley Ski Area.

Stacker published their "best value colleges in every state." Michigan Tech was named best in Michigan.

MSN shared Niche's 2019 list of best value colleges in America, which named Michigan Tech the best in Michigan.

Forbes has ranked Michigan Tech among the best universities in the country. The magazine’s website released its annual list of "America’s Top Colleges".

Michigan Tech named as a Midwest school joining forces to promote faculty success for women in STEM fields.

Michigan Tech Alumna to Speak at White House

Michigan Tech alumna Audra Thurston ('18, chemical engineering) spoke at a White House event in July, marking the one-year anniversary of an executive order to develop a national strategy to expand the skilled workforce in key industries like manufacturing. The event was streamed live on whitehouse.gov and on uppermichigan.edu and was covered in several newspapers including US Politics Today, Investor Point, Financial Buzz, Yahoo Finance, and Renewable Energy World.

Audra is a process engineer at Calumet Electronics currently working on a project with Silicon Valley company Averatek to bring ultra fine line trace and space technology to Calumet Electronics. Read the story in the Michigan Tech News.

Current Contracts & Grants

Barnard, Andrew (PI, ME-EM);

Barr, Nancy (co-PI, ME-EM); Seigle, M (PI, Humanities); Raber, M (co-PI, Pavlis Honors College); Romney, A; O Abeles (co-PIs, Humanities); “Human-Centered Engineering Initiative”; sponsor: National Endowment for the Humanities; total award: $34,999.

Bigham, Sajjad (PI, ME-EM);

Ghosh, Susanta (PI, ME-EM);

Naber, Jeff (PI, ME-EM), Odegard, Gregory; Sorby, Sheryl (Co-PIs, ME-EM), Raffaelli, Kellie (Co-PI, CD&I); Bowler, Michael (Co-PI, Humanities);

Ponta, Fernando (PI, ME-EM);
“Wind Turbine and Wind Farm Controls Code Evaluation for Reduced Order Models”; sponsor: Sandia National Laboratories; total award: $25,000.

Robinette, Darrell (PI, ME-EM);
“Dynamic Characterization of Torque Converter Clutches and Dampers”; sponsor: General Motors Company; total award: $133,762.

Tajiri, Kazuya (PI, ME-EM);

van Susante, Paul (PI, ME-EM);

Paul van Susante (assistant professor) shows ME-EM alumnus Stephen Brown (’81) some of the instructional materials used in Mechanical Engineering Practice 1 while aboard the Ranger III during this summer’s Alumni Reunion ME-EM Scholarship cruise.
CAPSTONE CORNER

Fresh Take on SCD

Twenty Two new Senior Capstone Design teams got underway during the first week of September, and are now brainstorming solutions to their design problems. A diverse set of projects are in the mix- ranging from building a field service apparatus for locomotives, to improving air/water rescue systems for downed airmen, to removing invasive aquatic plants from Great Lakes harbors, all the way to developing equipment for working in the permanently shaded regions of the moon. That’s 40K ambient, btw. -387°F.

Tough problems? You bet! Bring it on!

What better way is there to keep the upstream end of YOUR innovation pipeline stocked up?!

Want to develop a better manufacturing cell?

How about a fresh take on improving your product line?

Sharp MTU undergrad engineering students are at/near the optimum end of that decision matrix.

What are you waiting for?

We are planning projects that will be getting underway in early January. RIGHT NOW!

Let’s talk

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