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Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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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](#), [Instagram](#) and [Twitter](#).

ME-EM Department News & Accomplishments

AIAM Legislative Day - Michigan’s capitol building in Lansing, MI

On Tuesday, October 19, three ME-EM faculty and a three students took part in the Aerospace Industry Associate of Michigan’s (AIAM) Legislative Day at the capitol building inside the Speaker’s Library. **Dr. Greg Odegard** (John O. Hallquist Chair of Computational Mechanics), **Dr. Paul van Susante** (Assistant Professor) and **Dr. Brad King** (Richard & Elizabeth Henes Endowed Professor of Mechanical Engineering - Space Systems) provided a show and tell for the legislators. They displayed a lunar robot, three satellites and a composite panel, and then let the students do all the talking.

Emily Zeitunian (MSME student), **Matthew Seitsema** (sr. EE), and **Travis Wavrunek** (ME-EM PhD student) displayed their research projects right alongside the exhibits of companies from Michigan’s aerospace industry. Michigan Tech was the only university to attend, and the students were a big hit with the Senate & House representatives. Our point of contact at the capitol, Bill Kordenbrock (Michigan Tech’s VP for Governmental Relations) was very complimentary, impressed with their scope of knowledge and presentation skills, and proud of these young people that exemplify Michigan Tech’s students. The passion and knowledge that the students conveyed worked to reinforce to our lawmakers the importance of higher education in creating a skilled workforce to feed into the aerospace industry, and ultimately contribute to Michigan’s economy overall.

This was a valuable experience for the students, and a reminder that Michigan Tech is a player deserving of additional State funding. Through our students, Michigan Tech showed up strong and was heard in our state’s capitol. Met with

IN THIS ISSUE:	
• ME-EM Dept News & Accomplishments	1
• ME-EM Faculty & Staff Awards and Accomplishments	2
• ME-EM Faculty & Staff Award and Accomplishments	3
• Student Accomplishments & Awards	
• Student Competitions & Team Awards	4
• Alumni and Friends News, Accomplishments & Awards	
• University News & Awards	
• Area News	
• Current Contracts & Grants	5

==== Snapshots from Michigan’s capitol



Upper left: The Michigan Capitol dome. Lower left: Dr. Greg Odegard meets with Greg Markkanen in his office (note the Tech flag above his desk). Travis Wavrunek and Matthew Seitsema man the display. Photo credit: Dr. Paul van Susante

ME-EM Faculty & Staff Awards and Accomplishments

Dr. Parisa Abadi (Assistant Professor, ME-EM) and graduate student **Masoud Kasraie** were acknowledged for their article recently published in the journal [Additive Manufacturing](#) on the process, morphology, and properties of polymeric inks in a Tech Today article on how the properties of 3D-printable polymer nanocomposite ink are one of the keys to its many applications in the future of aerospace, medicine, and electronics. Read the full story in the [Michigan Tech News blog](#).



Dr. Jung-Yun Bae (Assistant Professor, ME-EM) was interviewed in September by the Korean Robot Newspaper for her research on optimizing the operation of multi-object robot systems and how she became interested in robot research. To find out more, click the link to [irobotnews.com](#).



Dr. Andrew Barnard (BSME '02, MSME '04) (Associate Professor, ME-EM/Director GLRC), Steven Whitaker (grad student, ECE), Timothy Havens (Assoc. Dean for Research, CC and Director, ICC) co-authored a paper published in [The Journal of the Acoustical Society of America](#) titled "Recurrent networks for direction-of-arrival identification of an acoustic source in a shallow water channel using a vector sensor." George Anderson of the U.S. Naval Undersea Warfare Center (NUWC) in Newport, Rhode Island was also a co-author. The work described in the paper was funded by the U.S. NUWC and Naval Engineering Education Consortium and the Office of Naval Research.

Dr. Barnard and Jake Soter (BSEE and BSCE '19, MBA '20) co-founded SwimSmart Warning Systems. This smart-connected device (modeled after a traffic light) is now used by two of Lake Michigan's busiest Michigan beaches to help beachgoers decide if it's safe to go in the water. Two

engineers and entrepreneurs found a faster, cheaper, technological solution to help prevent drownings. Check out a demo video recorded on the Great Lakes Research Center docks and read the story on [Michigan Tech News](#).



Dr. William J. Endres was selected for the Richard & Elizabeth Henes Endowed Professorship - Senior Capstone Design (SCD) Program. This appointment recognizes the importance of the ME-EM SCD program in our ME curriculum and, in particular, Dr. Endres' leadership in elevating the program to national prominence and one of the best in the U.S.



Dr. L. Brad King (Richard & Elizabeth Henes Professor of Space Systems, ME-EM) and the CEO of [Orbion Space Technology](#), was a keynote speaker at the [North American Space Summit](#) for their annual "LEO: The Gold Rush" meeting. Dr. King talked about the coming of age of small-satellite electric propulsion and the challenges facing the industry to commercialize propulsion products and manufacturing processes to meet increasing demands.



Dr. Brad King, and Dr. Jeffrey D. Naber were reappointed to their endowed professorships as the Richard & Elizabeth Henes Endowed Professors of Mechanical Engineering, in the areas of Space Systems and Energy Systems, respectively.



Dr. Guy Meadows (Research Professor, ME-EM and GLRC), was interviewed for an [MLive story](#) about nurdles, the industrial plastic pellets that are littering the Great Lakes beaches.



Dr. Guy Meadows and collaborators from Purdue University and the University of Wisconsin-Madison had their research addressing Lake Michigan coastline erosion and strengthening community relationships and was highlighted in joint press releases from [Sea Grant Illinois-Indiana](#), [Michigan Sea Grant](#) and [Wisconsin Sea Grant](#).



Dr. Trisha Sain (Assistant Professor, ME-EM) was featured in Tech's [Unscripted Research Blog](#) regarding her work on finding the calculations to explain degradation of materials to find a cheaper and more efficient way to predict and assess composites.



Dr. Sheryl Sorby (Professor Emerita, ME-EM) was named the recipient of the ABET 2021 Claire L. Felbinger Award for Diversity and Inclusion. Dr. Sorby received her B.S. in Civil Engineering, M.S. in Engineering Mechanics and Ph.D. in Mechanical Engineering from Michigan Tech. Read the full announcement on the [ABET website](#).



President Koubek honored Michigan Tech's faculty award recipients at a reception held this week. Dr. Jason Blough was honored with the Distinguished Professor award, and Dr. Greg Odegard was this year's Michigan Tech Research Award recipient. *Photo credit: Dr. Bill Predebon*

ME-EM Faculty & Staff Awards and Accomplishments

Dr. Paul van Susante (ME-EM Asst. Professor) was invited to be a panelist at the 168th meeting of the Aeronautics and Space Engineering Board being held virtually October 19-21, 2021. He will present to the Infrastructure for Lunar Human Exploration panel. [Review Dr. van Susante's slide deck](#) prepared for the meeting.

Dr. van Susante and members of his [Planetary Surface Technology Development Lab](#) (PSTD), working as part of "Team Liquid", earned a runner-up award for Phase 1 of NASA's Break the Ice Lunar Challenge (BILC). As runners-up, the team was awarded a \$25,000 prize. Here is the link for the [award announcement for the winners of NASA's BILC challenge](#).



Students in the PSTD test a ground penetrating radar mounted to a robotic mobility platform at the stamp sands. This testing is a part of NASA's LuSTR program where MTU will develop rover-mounted geotechnical and volatile surveying tools to support exploration of the Moon. *Photo: Hunter McGillivray*

Dr. Jeremy Worm (Instructor, ME-EM & Associate Director APSRC) was reappointed by governor Whitmer to the Michigan Truck Safety Commission, as covered by [ABC 10](#).

Dr. Jeremy Worm and the [APS LABS](#) partnered with Strange Development to work on making the REVolution engine, which utilizes a rotary exhaust valve to make engines used on drones and powersports vehicles cleaner to use. Read more about the REV on the [Unscripted Research Blog](#).

President Koubek recognized Tech's most dedicated faculty and staff at a Welcome Back Picnic celebrating their years of service to the Michigan Tech community. ME-EM dept honorees:

- **Connie Tuohimaa** (30 years) *Manager of Finance & Accounting*
- **Dr. Song-Lin Yang** (30 years) *Professor*
- **Paula Zenner** (30 years) *Director of Finance & Operations*
- **Dr. Bill Predebon** (45 years) *Department Chair & Professor*



Student Accomplishments/Awards

Eric Gotz (sr., ME), a Michigan Tech hockey team member, was named a Krampade All-American Scholar for the 2020-2021 school year.

Sunit Gridhar (Ph.D. student, ME-EM) was awarded a \$4,000 scholarship for winning the Martin Hirshorn Graduate Student Project Award by the INCE-USA (Institute of Noise Control Engineering of the USA). He also won the Inaugural INCE Student Fellowship and was awarded a \$6,000 scholarship. His advisor is Dr. Andrew Barnard (Assoc. Prof., ME-EM/Director GLRC)

Rajput Oudumbar and **Nathan D. Spike** (ME-EM Ph.D. candidates) are both recipients of Grad School Doctoral Finishing **Fellowships** and the DeVlieg Foundation Award for the summer 2021 semester. Their advisors are **Dr. Youngchul Ra** (Associate Professor, ME-EM), and **Dr. Darrell Robinette** (Assistant Professor, ME-EM), respectively.

Katy Pioch (sr., ME) was interviewed by Xena Workwear in an article titled "The Engineering Process" for her dedication to the Society of Women Engineers as a former section president.

Kyle Samluk (sr. EME), **Danny Ezzo** (so. MET) and **Will Jones** (UofM) competed in the Cannonball Run, a 2,800 miles drive from NYC to LA in a team-built solar car that ended up costing about \$14,000. For more about this exciting venture check out the story in the [Lansing State Journal](#), read their race blog posts [Cannonball Sun](#).



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Student Competitions and Team Awards

The National Association of Basketball Coaches named the following ME-EM students of Michigan Tech's 2020-21 men's basketball team members to the NABC Honors Court:

- ◆ Kyle Clow (jr. EME)
- ◆ Eric Carl (jr. EME)
- ◆ Owen White (jr. EME)
- ◆ Carter Johnston (jr. EME)
- ◆ Tyler Robarge (jr. EME)

This group was also awarded a Team Academic Excellence Award for maintaining a cumulative GPA of 3.56 for the entire season. Read more on the [Michigan Tech Athletics website](#).



Michigan Tech's Aerospace Enterprise team is one of three winners of the [University Nanosatellite Program](#), a three-year design competition funded by the Air Force Research Laboratory (AFRL), along with teams from the University of Minnesota and Texas A&M. The three teams are now headed to Phase B of the program which includes a multiyear development program to make the spacecraft ready for flight, funded by AFRL, and a launch opportunity from the U.S. Department of Defense. Read more in [TechToday](#), or read the full story on the [College of Engineering Newsblog](#).



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Alumni and Friends News, Accomplishments & Awards

Phoenix Copley (former mechanical engineering student) was featured in an article that appeared in WishHockeyNow, "[Behind the Mask: Capitals' Copley A Goaltender And A Scholar](#)".



Sanjal Gavande (MSME '13) is receiving media attention as a member of the team that built New Shepherd, the space rocket scheduled to launch Jeff Bezos into space on July 20. Profiles of Gavande ran in [The Times of India](#) and other international outlets.



Eric Roberts (ME-EM '93) was appointed as the new executive director of [20 Fathoms](#), a tech start-up incubator in Traverse City. His appointment was featured in the [Traverse City Record-Eagle](#).



Zhuo Xu (Ph.D.'21) was selected for a Young Researcher Award by the WasteEng Organising Committee for their presentation "Synergistic effects between fiber and plastic wastes through thermal treatment." **Dr. Ezra Bar-Ziv** (Prof. ME-EM) was his advisor.

University News & Awards

Michigan Tech's [Summer Youth Programs](#) was the subject of a [WLUC-TV6](#) feature story.



A three-part series on Michigan Tech's move-in weekend was published by the Daily Mining Gazette. The stories included a [report](#) on the University's efforts to ensure a safe and efficient move-in process in the midst of ongoing road construction, a [feature story](#) on students moving into the residence halls, and an [interview](#) with Dean of Students Wallace Southerland III.



A feature article on MTU students enjoying an "Afternoon on the Town" ran in the [Daily Mining Gazette](#).



K-Day returned to Chassell Park this year after having Michigan Tech's Annual student organization fair on campus last year due to Covid. Over 200 registered student organizations secured a booth at Chassell Centennial Park on Friday, September 10, 2021.



Michigan Technological University's newest Huskies are the largest incoming class the University has seen since 1982, accounting for a 23% increase in first-year student enrollment from fall 2020. Incoming academic credentials remain the highest in University history. Read the story in [TechToday](#) about why the class of 2025 is one for the record books.



Retired professor of Transportation Engineering and former dean of the Graduate School at Michigan Tech, Professor Emeritus Eugene Huang, passed away on June 14, 2021, at 103. Read more in [Dr. Huang's obituary](#).

Area News

Houghton County's population rise was credited to Michigan Tech's student population in a [Detroit News](#) story, which cited a similar story that ran in the [Daily Mining Gazette](#). Houghton County was the only county in the Upper Peninsula to see a population increase in the 2020 United States census.



The expected boost that Michigan Tech's and Northern Michigan University's incoming first-year classes will bring to the UP economy was the subject of a report on [WLUC TV6](#).



Current Contracts and Grants

Allen, Jeffrey (co-PI, ME-EM), James Baker (PI, VP for Research Dept., Michael Morely (co-PI, Innovation & Commercialization Dept.): “T3N - Post-Doc - High Power Electronics Cooling”; sponsor: Shear Cool, LLC; total award: \$10,000.



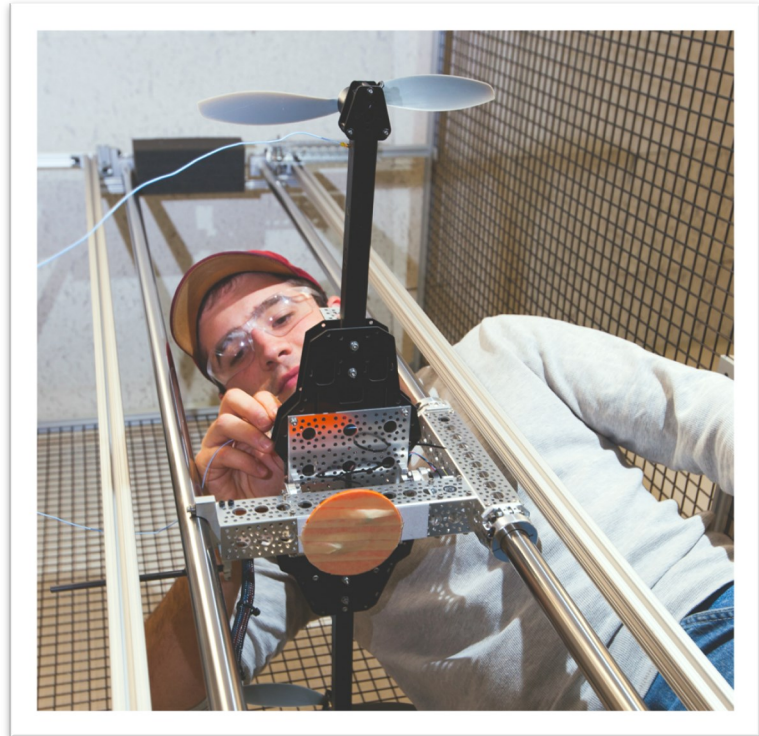
Bar-Ziv, Ezra (PI, ME-EM): “Conversion of Mixed Plastic Wastes into Polymer Alloys”; sponsor: Convergen Energy, LLC; total award: \$25,000.



Bar-Ziv, Ezra (PI, ME-EM): “Conversion of Mixed Plastic Wastes into Polymer Alloys”; sponsor: Kohler; total award: \$25,000.



Barnard, Andrew (PI, ME-EM/GLRC), John Lenters and Jamey Anderson (co-PIs, GLRC): “Lake Superior Environmental Monitoring Systems”; sponsor: University of Michigan, Cooperative Institute for Great Lakes Research (CIGLR); total amount: \$60,000.



An undergrad student in MEP4 working on a project which is hardware-based and focused on characterizing dynamics and vibrational characteristics of a bicopter, including PID control (vibration analysis, impact testing, modal analysis, operating deflection shapes, acoustics and sound, Simulink modeling, Kalman filtering, flow momentum & energy use, optimization, thrust and flowfield measurements).

Odegard, Gregory (PI, ME-EM/MARC): “ICME Optimization of Advanced Composite Components of the Aurora D8 Aircraft”; sponsor: University of Massachusetts - Lowell; total award: \$33,254.



Ovist, Grant (PI, ME-EM/APSRC), **Jeremy Worm, Wayne Weaver** (co-PIs, ME-EM/APSRC): “Delivery of Hands-On Professional Development Modules in Electrified Propulsion System Integration”; sponsor: Dana Systems; total award: \$49,222.



Schmidt, Henry (PI, ME-EM/APSRC), **Jeffrey Naber, Bill Atkinson** (co-PIs, ME-EM/APSRC): “Optical Measurement of Combustion Characteristics for Spark Ignition”; sponsor: General Motors; total award: \$130,898.



Tajiri, Kazuya (PI, ME-EM/MARC): “2021-2022 Aerospace Propulsion Outreach Program”; sponsor: AARC-TOS Technology Solutions, LLC; total award: \$3,824.



Van Susante, Paul (PI, ME-EM/MARC): “NASA GCD: Molten Regolith Electrolysis Technology Maturation”; sponsor: National Aeronautics and Space Administration; total award: \$27,264.



Weaver, Wayne (PI, ME-EM/AIM): “Thruster Concept Testing”; sponsor: Great Lakes Sound and Vibration Inc; total award: \$5,000.



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ME-EM Chair’s Philanthropic Advisory Board

Consider making an impact by joining the Chair’s Philanthropic Advisory Board (CPAB).

The Board was created to assist the ME-EM department chair in matters of fiscal strategy.

If you are interested in serving on the Board or would like to discuss it, please read the [CPAB Charter](#) and contact [Bill Predebon](#).