

ME-EM

Michigan Tech eNewsBrief

Vol. 19 | Issue 4 | DECEMBER 2023

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](#).

A Note from the Chair:

Winter has finally arrived! We've had an unseasonably warm winter season so far, but over the last two weeks, we finally got snow and cold. However, the forecast is for many days in the 30s coming up, so the cold isn't really going to be that cold! The late snow means that the snow statues are a week behind, along with all of the other facets of our area which require snow, whether it be snow-plowing businesses, KRC winter testing, snowmobiling, or any kind of skiing. We are glad to be getting the snow, we thrive on it!



We are having a great year so far in both research and student enrollment. Aerospace/space related topics, plastics recycling, and alternative energy topics continue to be hot research areas. Our incoming student deposits are up again, so we are anticipating another large incoming freshman class. Our current students continue to do great things and be recognized for them, as you will see in this newsletter.

The Huskies won the GLI with two great games, including a win over Michigan State!

Looking forward, you will see some exciting changes in the department both in our physical space as well as in our academic offerings. We will soon be taking over the 11th floor of the ME-EM building as Biology moves into the new H-STEM building. This means the ME-EM building will be all ours! We are working on plans to remodel the 11th floor space to support upcoming academic changes. We are also working to update our conference rooms and some other spaces. Hopefully, I can tell you about more exciting news in the department in our next newsletter, as we have big plans in process!

Thank you for your continued support. I hope to see many of you at Winter Carnival!

~ Jason R. Blough, Ph.D. | *ME-EM Department Chair and Distinguished Professor*

ME-EM Annual Report - 2022-2023

Table of Contents

- Research Updates
- Curriculum and Instruction
- Facilities
- New Faculty
- Research, Machine Learning
- Research, Ana Dyreson
- In Memoriam
- Student Success
- Alumni Profile and Activity
- Graduates



- Faculty Awards and Honors
- Patents and Publications
- Donors
- Grants and Contracts



Meet the ME-EM EAB

We are fortunate to have such a dedicated group of individuals who generously contribute their skills, guidance, and industry experiences to Michigan Tech. Our [ME-EM External Advisory Board](#) boasts 30 members representing industry, government agencies, academia, and the broader engineering profession. These experts provide invaluable advice on current industry trends, academic matters, program development, networking opportunities, professional growth, accreditation support, and insights into the future of engineering. Meeting on campus twice a year, EAB members offer their professional expertise, shaping the direction of engineering education within the ME-EM department.



Members of the ME-EM External Advisory Board - taken at our Fall 2023 meeting in September.
1st row L to R: Darrin Traczyk, Bill Flood, Brandon Dilworth, Alexa Ellsworth, Shashi Karna, Jason Verboomen.
2nd row L to R: Marie Cleveland, Al Frank, Brenda Moyer, Leah Lemanski, Heidi Mueller (Jason Blough)





Michigan Technological University

Faculty/Staff Awards/Accomplishments

Ezra Bar-Ziv (Professor, ME-EM) is actively involved in a collaborative effort with the University of Wisconsin–Madison and Braskem America through the REMADE Institute. The institute, funded by a DOE public-private partnership, will allocate \$600K to support the development of a novel recycling process technology. This initiative aims to extract pure polypropylene (PP) from multilayer plastic packaging waste. Dr. Bar-Ziv's focus involves spearheading the pilot-scale application of the innovative Solvent Targeted Recycling and Precipitation (STRAP) technology. Read more in the [COE News Blog](#).

Ana Dyreson (Assistant Professor, ME-EM) contributed to a new report published by the [Energy Systems Integration Group \(ESIG\)](#). The report is titled "Weather Dataset Needs for Planning and Analyzing Modern Power Systems: A Report of the Energy Systems Integration Group's Weather Datasets Project Team." As electric power systems change to incorporate more wind, solar, storage, transmission and flexible load, weather and climate drivers are increasingly important to planning modern power systems. This report assesses the gaps in weather data used for power system planning and outlines an approach to designing the ideal input datasets. Read more on the [ESIG website](#).

Brad King (Professor, ME-EM) was quoted by [UPWord](#) in a story about Lake Superior State University's new one-year Space Missions and Operations Certification program intended to train Upper Peninsula residents for careers in the aerospace industry.

Hassan Masoud (Associate Professor, ME-EM) has been named an editorial board member and associate editor of the [Journal of Engineering Mathematics](#). Established in 1967 and now published by Springer Nature, the Journal of Engineering Mathematics promotes the application of mathematics to problems from engineering and applied sciences.

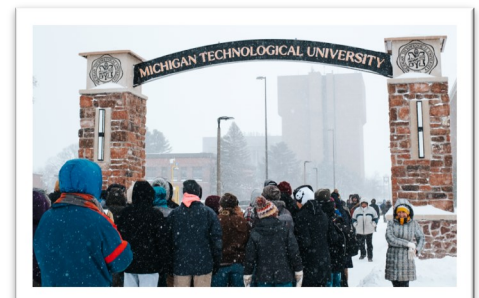
Dr. Masoud also led a collaborative team from Michigan Tech and Arizona State University that is among the Phase I winners of the [Innovating Distributed Embedded Energy Prize \(InDEEP\)](#). The prize is awarded by the Water Power Technologies Office of the U.S. DOE. The team earned recognition for its novel distributed embedded energy converter technology concept to efficiently transform wave power into electricity.

Jeffrey D. Naber is the 2023 recipient of the prestigious [Internal Combustion Engine \(ICE\) Award](#), presented annually by the American Society of Mechanical Engineers (ASME). Dr. Naber is the Richard and Elizabeth Henes Professor in Energy Systems and Director of the Advanced Power Systems Research Center (APSRC/APS Labs) at Michigan Tech. He was honored with the award at ASME's [2023 ICE Forward Conference](#), held Oct. 8-11 in Pittsburgh. The [ASME ICE Award](#) recognizes eminent achievement or distinguished contribution over a substantial period of time, which may result from research, innovation or education in advancing the art of engineering in the field of internal combustion engines; or in directing the efforts and accomplishments of those engaged in engineering practice in the design, development, application and operation of internal combustion engines. Naber, the recipient of Michigan Tech's [2022 Research Award](#), was nominated for ASME ICE Award recognition by Seong-Young Lee (ME-EM).

Vihn Ngyuen (Assistant Professor, ME-EM) was quoted by the [Mining Journal](#) in a story covering Showcase [AI], held at Michigan Tech late in early October. The story was picked up from the [Daily Mining Gazette](#). The showcase featured speakers, panels, workshops and interactive events on artificial intelligence and its impacts, and was previewed in a [Michigan Tech News](#) story.

Dr. Nguyen is co-PI on a NSF Experiential Learning for Emerging and Novel Technologies (ExLENT) grant titled "[Beginnings: Experiential Learning for the Mechatronics Workforce in the Upper Peninsula and Northern Michigan](#)" which is slated to receive \$999,930. The project is led by PI Aleksandr Sergeyev (AC) and includes co-PIs Scott Kuhl (CS), David Labyak (MMET) and Paniz Hazaveh (AC).

Gregory Odegard (Professor, ME-EM) was an invited speaker at the [Global Composites Expert Zoom Webinar Series](#) hosted by Purdue University. He discussed US-COMP, a project focused on developing new composite materials for deep space missions. US-COMP is using computational simulation to design materials efficiently and is playing a central role in the National Materials Genome Initiative. The project aims to design, fabricate, and test composite panels that meet NASA's requirements and train students for advanced composite materials workforce.



The West Gateway is complete and is seen here framing the ME-EM building during an MLK Day event.

Faculty/Staff Awards/ Accomplishments (cont'd)

Paul van Susante (Assistant Professor, ME-EM) recently accepted the Lou and Herbert Wacker Professorship in Mechanical Engineering, an endowed appointment aimed at retaining and attracting distinguished faculty. This position recognizes individuals who excel in their field, inspire students to explore beyond the curriculum, and seamlessly integrate research into the classroom. Further details about Dr. van Susante and the award can be found in the [ME-EM News](#).

Student Competitions & Team Awards

Roya Bagheri (Ph.D. candidate, ME-EM) and a cross-disciplinary research team of MTU undergrad and grad students and professors, co-authored an article published in the [Journal of Materials Research](#) in the Early Career Scholars in Materials Science issue. The article is titled "Conductive 3D nano-biohybrid systems based on densified carbon nanotube forests and living cells." The team worked with carbon nanotube (CNT) "forests," groupings of carbon nanotubes on which conductive biohybrid (cell-material) systems can be developed. Working with fibroblasts or cardiomyocytes, the researchers integrated the cell cultures with the CNT forests coated with gelatin. The novelty of the work lies in the use of the 3D structure of CNT forests as the main part of the scaffold and the development of a conductive, porous, and 3D cardiac scaffold with high cytocompatibility. The results show that the scaffold could be used in applications ranging from organ-on-a-chip systems to muscle actuators. Congratulations to Roya and the entire research team: Alicia Ball, (undergrad. ChemEng), Masoud Kasraie (Ph.D. candidate, MSE), **Aparna Chandra**, (MSME '21), Xinqian Chen (Ph.D. candidate, KEP), and Professors **Ibrahim Miskioglu** (Professor, ME-EM), Zhiying Shan (KIP), and **Parisa Abadi** (Assistant Professor, ME-EM).

Dr. van Susante was quoted by [Forbes](#) in a story about the development and testing of Lockheed Martin's inflatable space habitat, made of a strong, light, and flexible polymer yarn that's comparable to Kevlar and 10 times stronger than aluminum.

Dr. van Susante was also spotted on a satirical late-night TV show in the Netherlands. A snippet of an interview he did earlier this year for a [Dutch TV \(NOS Journaal\) News broadcast](#) about asteroid and lunar mining popped up on "[The Evening Show with Arjen Luback](#)".



Dr. Paul van Susante on "The Evening Show with Arjen Luback". (The clip is in Dutch, but Paul appears in the moon segment, which starts at 12:40).

A team of student researchers led by Assistant Professor **Paul van Susante** (ME-EM) will compete with five other teams in the final round of [NASA's Break the Ice Lunar Challenge](#). From its inception in 2020, teams in this challenge have proposed robotic systems that can use resources found on the lunar surface in regolith (icy moon dust) to aid astronauts living on the moon. "Excavating lunar regolith before humans arrive on the Moon will allow us to find uses for that material before they get there — if we could build a lunar habitat out of the regolith or extract the water for our astronauts to drink, that means less mass on our vehicles and less work for our crews," said Denise Morris, program manager for NASA's Centennial Challenges. The five finalist teams will bring their prototypes to a NASA-designated test facility in spring 2024 for the final showdown. Their designs will be tested under reduced gravity and transportation over complex terrain — not unlike conditions found on the moon. The first place team will receive a \$1 million prize, with \$500,000 going to the second place team. Teams can also be awarded testing time at one of NASA's Thermal Vacuum Chambers, which can simulate the temperature and atmospheric pressure conditions at the Lunar South Pole. To learn more about the team's challenge journey, visit the

[Mechanical Engineering-Engineering Mechanics News blog](#) and Michigan Tech's [2022 Research Magazine](#). [ExecutiveGov](#) covered [NASA's announcement](#) of the six winning teams in Phase 1, Level 2 of the Break the Ice Lunar Challenge — including Michigan Tech's [Planetary Surface Technology Development Lab](#). The PSTDL earned a \$75,000 prize and advanced to the challenge's final round. The team will bring their prototype to a NASA-designated test facility for a series of head-to-head matchups with the other finalists in spring 2024.

Congratulations to the team — we can't wait to see what's next!

Dante Basanese (sr, EME) was one of four members of Michigan Tech's football team named to the College Sports Communicators Academic All-District Team. Dante competed in nine games for the Huskies this season, posting 50 total tackles, a team-high three interceptions and two forced fumbles. Read more at [Michigan Tech Athletics](#).



**Michigan
Technological
University**

Student Competition & Team Awards *(cont'd)*

Michigan Tech's Sailing Club traveled to Larchmont, New York, to compete in the [2023 Intercollegiate Offshore Regatta](#), held Oct. 7-8. Competing with over 30 other college sailing teams from three different countries, the Huskies managed to sail "Hornet", skippered by **Andrew Michels (jr., EME)**, to a [second-place finish in the J105 class](#). Photos from the regatta are available [online](#). For more information about the Sailing Club at Michigan Tech, visit the [Michigan Tech Sailing Club](#) website.



Photo credit: Steve Cloutier.
@BlockIslandSteve and @StormTrysailClub.

Student Accomplishments & Awards

Tania Demote Gonzalez (Ph.D. candidate, ME-EM) attended the [International Network on Offshore Renewable Energy's \(INORE\)](#) 2023 European Symposium in December, a five-day meeting for researchers specializing in offshore renewable energy. Tania researches wave energy converter non-linear control and is part of the graduate student team using [MTU Wave](#), the campus-based wave tank. At the symposium, Tania presented her talk on "Time-Varying Hydrodynamic Modeling of a Variable Geometry Oscillating Surge Wave Energy Converter" and received a Best Presentation Award. The presentation was a collaboration with NREL's Dr. Nathan Tom and discussed the methods used to find a time-varying model for variable geometry surge wave energy converters. Tania is a remote intern at the National Renewable Energy Laboratory (NREL) in Colorado and was awarded Michigan Tech's Topping Teaching Fellowship in the Fall of 2022. Read more in the [ME-EM News blog](#).

Luke Schloemp (MS student, ME-EM) was quoted by [WLUC TV6](#) in a story about more than 500 MTU students who participated in Make a Difference Day on Saturday (Oct. 28).

Kyle Kukkonen (2nd yr, EME) was mentioned by the [Hockey News](#) in a story highlighting "The Top 100 NCAA Players to Watch in 2023-24." Kukkonen was ranked No. 43. As a freshman, Kyle's 18 goals were tops on the Huskies and his 27 points put the [Anaheim Ducks](#) draft pick second on the squad.

Nine MTU students were elected to nationwide leadership roles in the Arnold Air Society (AAS), a student organization dedicated to national defense education and community service. Operating under the guidance of student leaders, AAS has over 2,000 members across 115 universities nationwide. The 2023-24 Michigan Tech AAS National Staff Roster includes ME seniors: **Kyle DeNeef** as national commander, **Carinn Tryon** as national director of operations, **Brandon Collins** as national director of support, and **Catherine Prince** as national director of training. Read the story in [Tech Today](#).

Carissa Best and Tory Cantrell, (2nd yr., EME), **Marisa Mathews** (1st yr., EME), **Talia Olson and Amanda West** (sr., EME) were among the 16 students from Michigan Tech in the Society of Women Engineers (SWE) section to attend the SWE

WE23 Societal Conference in Los Angeles, California, with Gretchen Hein, SWE advisor. The SWE WE23 Career Fair is the largest career fair for women in the world. SWE thanks our corporate sponsors for their generous support, which enabled us to fund 100% of the students' travel! Read more in [Tech Today](#).

The Grad School announced the fall 2023 recipients of the Dean's Award for Outstanding Scholarship and the Outstanding Graduate Student Teaching Awards. ME-EM PhD candidates **Ponkrshnan Thiagarajan** (advisor: Ghosh) and **Swapnil Bamane** (advisor: Odegard) received the Dean's Award for Outstanding Scholarship for their exceptional academic and professional qualities. PhD students **Ashvin Vinodh** (Iyer), **Ben Jewell** (Sain), **Samikhshak Gupta** (Ponta), **Tyler White** (Naber) and MS student **Tyler Fabian** (Weaver) were also commended for their outstanding contributions to teaching excellence, earning them Outstanding Graduate Student Teaching Awards. Visit the Grad School's [Awards and Honors page](#) for more information.



**Michigan
Technological
University**

Student Accomplishments & Awards (cont'd) ...

ME students **Jason Rogers, Cameron Whiteside, Katie Morin, Julian Arens, Jackson Arens, and Joaquin Sibug**, and MSE student Aaron Boonstra, spent a full week in November attending educational sessions, networking with industry professionals, and exploring the vast trade show floor of the [International Associate of Amusement Parks and Attractions Expo](#). Industry leader [LAI Games](#) sponsored the group and covered the cost of attendance. All are members of the [Theme Park Engineering Group](#) (TPEG) here at Michigan Tech.

Alumni & Friends News, Accomplishments & Awards

Marty Lagina (BSME '77) delivered the First-Year Engineering Series Lecture, titled "I'm Not Here to Give You Advice" to Michigan Tech's incoming engineering majors in the Rozsa Center Auditorium. Lagina is the CEO of [Heritage Sustainable Energy](#), a winemaker, and an executive producer of the long-running reality TV show "[The Curse of Oak Island](#)," now in its 10th season on the History Channel. Read more about the lecture on the [College of Engineering Blog](#).

Marty Lagina and Craig Tester (BSME '77), known for the History Channel's "The Curse of Oak Island", were the subjects in a [Looper](#) story delving into their shared history. The duo were roommates while studying at Tech — both hold bachelor's degrees in mechanical engineering.

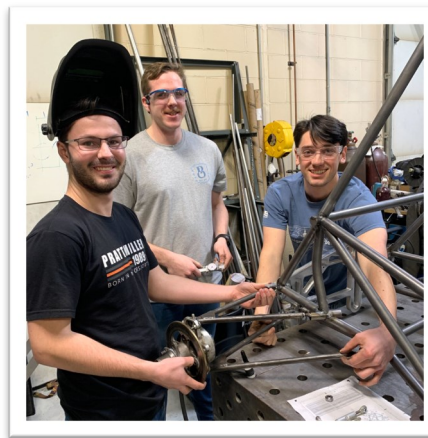
Andy Morello (BSME '09, MSME '11) returned to his alma mater to present "LANL Test Engineering's Structural Dynamics Research and Development Efforts" for the ME-EM Graduate Seminar series. Morello has been a staff member at Los Alamos National Laboratory for over 10 years. During

his time at Michigan Tech, he specialized in experimental structural dynamics within the ME program.

The [Hill](#) published an opinion article written by **Madhukar Vable** (Professor Emeritus, ME-EM) discussing anger-provoking challenges facing higher education.

Grant Weidler (BSME '90) garnered recognition in the [Austin News](#) for his recent appointment to the Texas State Board of Acupuncture Examiners.

Aurora White (BSME '16) has been honored as the American Indian Science and Engineering Society ([AISES](#)) 2023 Most Promising Engineer. This noteworthy achievement was highlighted by NASDAQ, which picked up the story originally covered by Stellantis Media. White, currently serving as a torque calibration security engineer at Stellantis, also gained mention in DBusiness, which emphasized her ties to Michigan Tech. Read more about Aurora in the [Stellantis](#) news release and on the [COE News Blog](#).



[SAE Formula Car Enterprise](#) team members, Zander Worm (sr., EME), Justin Hannah and Miles Sterling (srs., MET), are seen welding a new car frame in the photo. Photo credit: Kaleb Coble (Formula Enterprise president)

ME-EM Graduate Seminar Speaker Series - Fall semester

October - December, 2023

Bhisham Sharma, PhD - Associate Professor, Michigan Tech, ME-EM.

["Enabling Structural Multifunctionality Through Additive Manufacturing"](#)

Byung-Jun Yoon, PhD - Associate Professor, Electrical & Computer Engineering Texas A&M University
["Leveraging AI/ML in Science to Enable Optimal Design and Accelerate Novel Discoveries"](#)

Andy Morello - Group Leader Los Alamos National Laboratory Abstract Los Alamos National Laboratory.
["LANL Test Engineering's Structural Dynamics Research and Development Efforts"](#)

Kuan-Lin Lee, PhD - Lead Engineer, R&D Division Advanced Cooling Technologies Inc. ["Advanced Two-Phase Cooling Technologies for Space Applications"](#)

Je-Heon Han, PhD - Associate Professor, Department of Mechanical Engineering Tech, University of Korea.
["Non-destructive Evaluation in Thin Structures and Mechanical System Design & Development with CAE"](#)

Hope Digiusto - Sr. Technical Program Manager, Project Kuiper at Amazon. ["Commercial Satellite Communications Overview and Space Field Career Insights"](#)

Kurt Schneider - Engineering Group Manager, Advanced Dynamics, Noise & Vibration. ["Engineering Skills of the Future"](#)

Thomas Seel (Retired) - Chief Vehicle Engineer, Stellantis - ["The Evolution of Engineering: An Automotive Perspective Looking Forward"](#)

Shawn Brueshaber, PhD - Assistant Professor Mechanical Engineering-Engineering Mechanics Michigan Technological University.
["Unexpected Discoveries in Jupiter's Atmosphere by the Juno Mission"](#)

University News/Awards

Former Michigan Tech President Dale F. Stein [passed away](#) Oct. 9 in Tucson, Arizona. He served as Michigan Tech's president from August 1979 until his retirement in 1991. Prior to Stein's presidency, he served as head of the Department of Metallurgical Engineering and vice president of academic affairs at Michigan Tech. He was inducted into the University's [Academy of Metallurgical and Materials Engineers](#) as part of the inaugural 1996 class.



[Gov. Gretchen Whitmer](#) mentioned Michigan Tech in a press release announcing a Scout Motors research and development facility coming to Novi, Michigan. MTU was listed as one of three university participants in the Michigander EV Scholars program, which offers top tech students a \$10,000 scholarship incentive to find jobs in Michigan's electric vehicle (EV) and transportation mobility sector. The announcement was picked up by [Michigan Business Network](#).



The [U.S. DOE](#) mentioned Michigan Tech in a press release announcing projects selected to receive an overall \$16.7 million in funding to advance production of affordable biofuels and biochemicals. MTU will receive \$2.4 million for a project looking to refine the solvent targeted recovery and precipitation, or STRAP, method of plastics recycling. The press release was picked up by [Green Car Congress](#).



[Plastics Recycling Update](#) mentioned Michigan Tech in a story about 14 research and development projects funded by the REMADE Institute, which is supported by the U.S. Department of Energy. MTU received two awards to fund research on solvent-based plastic recycling (\$600,000) and recycling of all-polyolefin multilayer flexible packaging (\$200,000).



[Gov. Gretchen Whitmer](#) and the [Michigan Business Network](#) mentioned Michigan Tech in connection to a \$7.5 million grant and a 15-year, 100% state essential services assessment exemption awarded to Calumet Electronics to support construction of a first-of-its-kind package substrate factory. MTU was credited as graduating the "brilliant engineers" behind the company's innovations.



[U.S. Sen. Gary Peters](#) mentioned Michigan Tech's "incredible engineers" during a Senate Commerce Committee hearing on Oct. 6.



The [Daily Mining Gazette](#) covered Lt. Gov. Garlin Gilchrist's early look at Michigan Tech's H-STEM Engineering and Health Technologies Complex during his visit to Houghton on Saturday (Oct. 21). University President Rick Koubek accompanied Gilchrist on the tour.



The [East Village Magazine](#) and [Ludington Daily News](#) mentioned Michigan Tech as one of the state universities where enrollment has increased, despite an overall statewide decline.



[Midland Daily News](#) mentioned Michigan Tech as among the few Michigan universities seeing "surging enrollment" despite an overall statewide decline. The story cited enrollment statistics first reported in a [Michigan Tech News](#) story.



Undergraduate student Joe Dlugos was quoted in a [WLUC TV6](#) story previewing Michigan Tech's [102nd annual Winter Carnival](#). Dlugos is president of the Blue Key Honor Society, which hosts Winter Carnival. The theme of this year's festivities is "From Forests to Shores We Love the Outdoors." It begins Feb. 7, 2024.



The [Mining Journal](#) mentioned Michigan Tech in a story about the results of the most recent labor study in the Upper Peninsula, which found that 25% of the degrees awarded in the U.P. are engineering degrees.



The [Keweenaw Report](#) covered the Higher Learning Commission's approval of the Michigan Tech Bachelor of Science in Nursing, announced by the Office of the Provost on Oct. 17.



Michigan Tech hockey's Blake, Logan and Chase Pietila — and their cousin, Jed Pietila — were mentioned by [NHL.com](#) in a story about brother combinations on NCAA hockey rosters this season.



Michigan Tech was granted nearly \$860,000 by the DOE to establish the Center for Climate-driven Hazard Adaptation, Resilience, and Mitigation (C-CHARM). This initiative is designed to enhance regional climate resilience in the Great Lakes area and aims to empower rural community planners by providing essential climate data and tools to better prepare for climate change and severe weather. Led by a team of faculty, including Drs. Pengfei Xue (CEGE), [Ana Dyreson](#) (Asst Professor, ME-EM), Chelsea Schelly (SS), Jenny Apriesnig (COB), and David Watkins (CEGE), the center will integrate climate modeling and risk assessment into a toolkit, addressing natural disasters and energy grid vulnerabilities and leverage existing capabilities, including MTU's Rural Hazard Resilience Tool, Argonne's Climate Risk & Resilience portal, and DOE projects like COMPASS-GLM and CROCUS. The research will provide detailed climate change modeling for the Western UP, aiding community planners in identifying risks and disruptions for effective adaptation and response strategies. Read the [Michigan Tech News](#) article to learn more.



Contracts & Grants

Allen, Jeff (PI, Professor, MEEM); Project Title and Sponsor Not Disclosed Due to Limited Sharing Terms and Conditions; total award: \$50,000.

Bar-Ziv, Ezra (PI, Professor, MEEM); “Extraction of polyethylene (PE) polypropylene (PP) and Polyethylene terephthalate (PET) from the non-Recyclable Fraction 3-7 at Recycle 906”; sponsor: Michigan Dept of Environment Great Lakes and Energy (EGLE); total award: \$320,658.

Johnston, William (PI, Postdoc, MEEM) and **Bhisham Sharma** (Co-PI, Associate Professor, MEEM); AeroFeathers Inspired by Owls NASA 80NSSC23K0954”; sponsor: National Aeronautics and Space Administration (NASA); total award: \$79,889.

Long, Fei (PI, Assistant Teaching Professor, MEEM) and **Ezra Bar-Ziv** (Professor, MEEM); “Fast Characterization of Plastics Using Mid-Infrared Spectroscopy and Machine Learning”; sponsor: SABIC; total award: \$25,099.

Malladi, Sriram (PI, Assistant Professor, MEEM); “Hydraulic Sound Characterization”; sponsor: Caterpillar Inc.; total award: \$81,500.

Miers, Scott (PI, Assoc. Professor, MEEM); “Yamaha Engine Testing”; sponsor: Pat's Motor Sports; total award: \$1,500.

Naber, Jeff (PI, Professor, MEEM) and **Jaclyn Johnson** (Co-PI, Associate Teaching Professor, MEEM) and **Radheshyam Tewari** (Co-PI, Teaching Professor, MEEM); “A Low GHG Advanced SI Engine that can Operate on NG and NG/H2 Blends with Diesel-Equivalent Performance for Off-Road Applications”; sponsor: US Dept of Energy/Office of Energy Efficiency and Renewable Energy (EERE); total award: \$990,786.

Naber, Jeff (Co-PI, Professor, MEEM) and **William Atkinson** (PI, Research Engineer, APSRC); “Optical Investigation of In-cylinder Spray and Combustion Visualization through Borescope in a Light-Duty Pre-chamber Engine”; sponsor: Aramco Services Co; total award: \$19,091.

Nguyen, Vinh (Co-PI, Assistant Professor, MEEM); Project Title and Sponsor Not Disclosed Due to Limited Sharing Terms and Conditions; total award: \$370,420.

Odegard, Greg (PI, Professor, MEEM), **Vinh Nguyen** (Co-PI, Associate Professor, MEEM) and **Wayne Gersie** (Co-PI, VP Diversity & Inclusion); “PREP Gaithersburg: Establishment of a NIST Gaithersburg PREP Program at Michigan Technological University”; sponsor: US Dept of Commerce/National Institute of Standard and Technology (NIST); total award: \$90,597.

Tajiri, Kazuya (PI, Associate Professor, MEEM) and **William Endres** (Co-PI, Associate Professor, MEEM); “Aerospace Propulsion Outreach Program: Thrust Reversal”; sponsor: Innovative Scientific Solutions Inc; total award: \$18,999.

Van Susante, Paul (PI, Assistant Professors, MEEM); “Regolith Overburden Structures on the Moon: Design and ConOps for Emplaced Protection”; sponsor: SpaceFactory Inc; total award: \$45,000.

CAPSTONE

ORGANIZER

Senior Capstone Design Update

Thanks to our sponsors for supporting the development of the next generation of engineers at Michigan Tech. We appreciate your continued support.

Below is a partial list of the companies that have engaged in meaningful projects with our students, playing an instrumental role in the success of the Senior Capstone Design Program.

- **John Deere** | Mr. Akshay Soma, NVH Engineer
Project Name: “Displacement Measurement System”
- **Our Next Energy** | Mr. Raymond Coyle, Assistant Chief Engineer
Project Name: “Undisclosed Project Title”
- **Faith Technologies, Inc.** | Mr. Chad Ziesemer, Engineering Manager
Project Name: “Energy Storage Device for Microgrid”

Contact Dr. Bill Endres (wjendres@mtu.edu) with questions about the program.

You can have effectiveness without efficiency, but you can't have efficiency without effectiveness.

From: *A Game Against Reality: Engineering Practice and Professionalism in a Physical World Inhabited by Humans*
by William J. Endres, Program Director (publication forthcoming)

CAPSTONE
DESIGN PROGRAM