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ME-EM eNewsBrief, Mar 2024

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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Greetings from the Chair

Spring is here and we have some exciting news! After a nationwide search, Dr. Andrew Barnard (BSME 02' MSME 04') has been appointed as the next VP for Research here at Michigan Tech. We are excited to welcome him back to campus as he was a member of our faculty before his most recent tenure as Director of the Graduate Acoustics program at Penn State.

This spring, we celebrated the completion of the H-STEM complex, now open for health-related research, and inaugurated the Alumni Gateway Arch on the west end of campus. We also marked our 56th Senior Recognition Banquet/Order of the Engineer Ceremony and successful Senior Design Day, showcasing year-long [industry-sponsored projects](#). Keep in mind, we welcome sponsorship inquiries for future projects! Contact Bill Endres at wjendres@mtu.edu.

Looking ahead, we're proposing a Bachelor of Science in Aerospace Engineering, poised for approval this summer. The innovative curriculum, based on our successful ME Practice program, is set to launch in Fall 2025, aligning with the university's goal of reaching 10,000 students by 2025. Additionally, plans are underway to reconfigure and repurpose the 11th floor of the ME-EM Building to accommodate this expansion.

Congratulations to Dr. Ibrahim Miskioglu on his retirement after a long and successful career in the department! Dr. Miskioglu has been teaching statics and mechanics of materials, carrying a heavy teaching load for many years. In recognition of his contributions, he has been granted Emeriti status from MTU.

Wishing you a fantastic spring and summer! We hope to see many of you at the Alumni Reunion from July 31 to August 3, where you can reconnect with campus and the department. Thank you for your unwavering support; our alumni are integral to the success of the department and MTU. THANK YOU!

Jason R. Blough, Ph.D.

ME-EM Department Chair & Distinguished Professor

Dr. Ibrahim Miskioglu to retire

After a successful career spanning 38 years, [Dr. Ibrahim Miskioglu](#) has decided to embark on a well-deserved retirement journey. Since joining Michigan Tech as a visiting assistant professor in 1985, Dr. Miskioglu has been an invaluable asset to our institution, leaving an indelible mark on both our department and the broader academic community.

With a rich academic background, including a Ph.D. in Engineering Mechanics from Iowa State University, an M.S. in Mechanical Engineering from Mississippi State University, and a B.S. in Mechanical Engineering from Bogazici University, Dr. Miskioglu brought a wealth of knowledge and expertise to his role.

Throughout his tenure, Dr. Miskioglu's dedication to excellence has been evident in his numerous contributions. As the faculty advisor for BoardSport Technologies, he nurtured countless students, guiding them toward success in their academic and professional endeavors. Additionally, his prolific scholarly output, comprising 42 book chapters and extensive involvement in professional societies, reflects his commitment to advancing the field of engineering mechanics. He served as the Solid Mechanics Area Director and as a member of the ME-EM Executive Committee from 2014 to 2022.



Save the date for [Alumni Reunion 2024](#)! Alumni and friends are invited to join us on campus for the celebration. From Tech Talks to boat cruises, August 1–3 will be filled with fun and unique campus experiences. Registration is open!



Visit our blogs on the mtu website:

- ◇ <https://blogs.mtu.edu/engineering/tag/meem/>
- ◇ <https://blogs.mtu.edu/engineering/>
- ◇ <https://www.mtu.edu/mechanical/news/>
- ◇ <https://www.mtu.edu/magazine/2024/>

ME-EM Faculty & Staff

Awards and Accomplishments

Dr. Jeffrey S. Allen (John F. & Joan M. Calder Professor of Mechanical Engineering, Associate Chair and Director of Undergraduate Studies, ME-EM) was invited to present and participate in a panel session at the upcoming [Committee on Biological and Physical Sciences in Space](#) (CBPSS) Spring meeting (March 19-21) hosted by the National Academies of Sciences, Engineering, and Medicine. Dr. Allen shared his insights on the key science questions surrounding the theme "Probing Phenomena Hidden by Gravity or Terrestrial Limitations," with a particular emphasis on thermal physics in microgravity and its wide-ranging implications for space exploration and contributed to a panel addressing unique scientific inquiries pertinent to space exploration. The meeting was part of the [2024 Space Science Week](#), a joint meeting of the discipline committees of the Space Studies Board of the U.S. National Academies, in collaboration with the Board on Physics & Astronomy and the Aeronautics & Space Engineering Board. These groups met to discuss advances and challenges in space and Earth science and exploration at the National Academy of Sciences in Washington, DC.

Dr. Shawn Brueshaber (Assistant Professor, ME-EM) gave a brief "Tech Talk"-style introductory presentation for the Michigan Tech Research Forum in January. The Office of the Provost presents Michigan Tech Research Forum events in coordination with the VP for Research Office.

Dr. Fei Long (Assistant Teaching Professor, ME-EM), **Shiying Cai** (MSME '22, ME-EM Ph.D. '23) and **Adeyinka Adekunle**, both ME-EM Research Engineers, along with [SWE](#) members and MTU researchers, volunteered to judge 3-5th grade inventions at [Baraga Elementary's Invention Convention](#).

Dr. Jaclyn Johnson (Associate Teaching Professor, ME-EM) was selected by COE Dean Audra Morse for the [Deans' Teaching Showcase](#) and is a candidate for the [CTL Instructional Award Series](#). This is a well-deserved recognition of her dedication to student success. Jaclyn serves as advisor for the [Engineering Ambassadors](#) at Michigan Tech, impacting K-12 outreach and professional development. Her leadership fosters collaboration, communication skills, and inspires future engineers. Read more in [Tech Today](#).

Dr. Brad King (Richard & Elizabeth Henes Professor in Space Systems Engineering, ME-EM) and **Jason Sommerville** (ME-EM Ph.D. '09), co-founders of Houghton's [Orbion Space Technology](#), were named to [Fast Company's "Most Innovative Companies 2024"](#) list. Companies that send satellites into space on a rocket can use Orbion's thrusters to maneuver them precisely to their final destination. Orbion, part of the MTEC SmartZone, "specializes in small plasma thrusters that help satellites ease into precision orbits, make evasive maneuvers, and safely reenter and burn out in Earth's atmosphere at the end of their life cycle." Explore further information about Orbion in the [ME-EM News article](#) and in Michigan Tech's [2022 Research Magazine](#).

Dr. Hassan Masoud (Associate Professor, ME-EM) was a recipient of the next [Great Lakes Research Center/Institute of Computing and Cybersystems](#) (GLRC/ICC) [Rapid Seedling Awards](#). These awards provide "seedling money" for preliminary research that aims to scale into larger projects with external sponsors. Dr. Masoud will receive \$10,000 through the GLRC to work on his project "Harnessing Kirigami-Inspired Composites for Wave Energy Conversion". Read more on the [Institute of Computing and Cybersystems Blog](#).

Dr. Jeffrey Naber (ME-EM/APSRC) is the PI on a project that received a \$2,540,848 research and development co-op joint agreement from the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE). The project is titled "A low GHG advanced SI engine that can operate on NG and NG/H₂ blends with diesel-equivalent performance for off-road applications." Zach Stanchina (APSRC), **Jaclyn Johnson** (Assoc. Teaching Professor, ME-EM), **Radheshyam Tewari** (Teaching Professor, ME-EM/APSRC) and Wayne Gersie (ODI/APSRC) are co-PIs on this potential three-year project.

Dr. Gregory M. Odegard (John O. Hallquist Chair in Computational Engineering and University Professor, ME-EM), with his wealth of experience in guiding large multidisciplinary research teams, is preparing to undertake a promising new research project supported by AFRL.

Greg's team will work with researchers at Florida State University, Columbia University, and Penn State to develop the next-generation of composite materials for hypersonic aerospace vehicles. These composites will have significantly improved manufacturability and thermo-mechanical performance relative to state-of-the-art composites. The material development will be driven by multi-scale computational modeling. Read more about this \$5 million project in the [ME-EM News](#).



ME-EM Faculty & Staff Awards & Accomplishments (cont'd)

Dr. Paul van Susante (Asst. Prof., ME-EM) secured a \$5,000 HONES grant from the Michigan Space Grant Consortium (MSGC), sponsored by NASA. The grant supports his proposal, "[NASA Lunabotics Competition](#)," aiding curriculum enhancement and faculty development.

Student Accomplishments & Awards

Matthew Beals (sr., MS student) was among the recipients of the Michigan Space Grant Consortium (MSGC) awards for the 2024-25 cycle, as announced by the Graduate School. The MSGC, sponsored by NASA and comprising 52 consortia, promotes awareness, research, and education in space-related science and technology in Michigan. Beals received a \$5,000 [Graduate Fellowship](#) for his project: "Advancing Adaptive Aerostructures: Utilizing Steady-State Traveling Waves for Drag Reduction and Sustainable Aviation." **Dr. Sriram Mal-ladi** (Asst., Prof., ME-EM) is Matt's advisor.

Ayush Chutani (ME-EM Ph.D. student), advised by **Dr. Ana Dyreson** (Asst. Prof., ME-EM), secured third place at the Graduate Student Government (GSG) Graduate Research Colloquium on March 26, as part of the Great Lakes Research Center (GLRC) [Student Poster Awards](#) in honor of World Water Day 2024.

Shashank Pathrudkar and **Abhishek Patil** (Ph.D. candidates, ME-EM) were recipients of the Grad School's doctoral Finishing Fellowships for spring 2024, advised by ME-EM Asst. Professors **Dr. Susanta Ghosh** and **Dr. Jung-Yun Bae**, respectively. Check out their student profiles on the [Graduate School Newsblog](#).

Cora Taylor (ME-EM Ph.D. candidate), **Jason Blough** (Distinguished Prof. & ME-EM Dept. Chair), **James De Clerck** (Prof. of Practice, ME-EM) and **Chuck Van Karsen** (Res. Assoc. Prof. & Prof Emeritus, ME-EM) co-authored a paper "PDADyE Applied to a 2-attachment Fixture Case," which was selected by the International Modal Analysis Conference (IMAC) Dynamic Environments Testing (DET) focus group as the winner of the DET Best Paper Award. This recognition highlights the paper's significant contributions and advancements in the DET field. The award was officially announced during the IMAC-XLII Award Luncheon in Orlando.



Jason Blough, Cora Taylor and Jim De Clerck receiving SEM's "DET Best Paper Award"

Zachary Thelander (sr., EME) was selected as the 2024 ME-EM Department Scholar and is eligible for the Provost's Award for Scholarship. Zachary was nominated by **Dr. Aneet Narendranath** (Assoc. Teaching Prof., ME-EM). In recognition of our outstanding students, the department is again offering a 1-year GTA to the top two nominees - Zachary and **Cooper Evans** (sr., EME), nominated by **Dr. Jaclyn Johnson** (Assoc. Teaching Prof., ME-EM).

ME-EM Ph.D. students and GTAs **Revanth Matthey** (advised by **Dr. Susanta Ghosh**, Asst. Prof., ME-EM), and **Abhishek Patil** (**Dr. Jung-Yun Bae**, Asst. Prof., ME-EM) were selected as spring '24 recipients of the Dean's Award for Outstanding Scholarship.

Gita Deonarain (advised by **Dr. Jason Blough**, Prof., ME-EM), **Thomas Draper**, and **Abhishek Keripale** (Dr. Susanta Ghosh), **Anwar Mohammed** (Dr. Bhisham Sharma), and **Goutham Viyyapu** (Dr. Kazuya Tajiri) were also awarded for their excellence in teaching as recipients of the Outstanding Graduate Student Teaching Award. For details about each award, view the Grad School's [Awards & Honors page](#).

Michigan Tech's GLRC announced the Fall 2023 recipients of its [Student Research and Travel Grants](#). These grants provide opportunities to write competitive grants, conduct research, or attend professional conferences. ME-EM PhD Student Awardees, and their ME-EM faculty advisors, include:

- **Shelbie Wickett**, Attending: Photovoltaic Specialists Conference - Presentation: "Trends in Solar PV Growth in Snowy Climates and Impact on Resource Adequacy"; GLRC member advisor: **Dr. Ana Dyreson** (Asst. Professor).
- **Abhishek Patil**, Attending: 2023 INFORMS Annual Meeting - Presentation: "Task Allocation and Path Planning for Multiple Tethered Autonomous Underwater Vehicles"; GLRC member advisor: **Dr. Jung Yun Bae** (Asst. Professor).
- **Adnan Hilal**, Attending: Inaugural MultiSector Dynamics Workshop - Presentation: "Data-Driven Analyses for Electrification and Weatherization Challenges Facing Rural Northern Communities"; GLRC member advisor: **Dr. Ana Dyreson** (Asst. Professor).
- **Muhammad Usman**, Attending: American Physical Society Division of Fluid Dynamics - Presentation: "Collective Hydrodynamics of Robotic Fish"; GLRC member advisor: **Dr. Hassan Masoud** (Assoc. Professor).

Student Competitions and Team Awards

Chase Pietila (fr., ME) was named to the CCHA Tim Taylor Award Watch-List. Pietila, a defenseman, leads Tech and shares a tie lead in the CCHA for assists, with 16. He ranks fourth in the nation amongst rookie defensemen. He also leads the Huskies with 40 blocked shots, which is fourth in the CCHA. The Tim Taylor Award, previously known as National Rookie of the Year, is sponsored by the Hockey Commissioners Association and voted on by NCAA Division I assistant coaches. Read more at [Michigan Tech Athletics](#).

Michigan Tech's [Planetary Surface Technology Development Lab](#) is making a name for itself in the aerospace industry with innovative ideas and engineering prowess. The PSTDL is a group of space-obsessed graduate and undergraduate students who compete in a variety of NASA Centennial Challenges - a series of competitions offering financial prizes for devising technology that helps advance NASA's goal to support a sustained human presence on the moon. Spend a year with **Travis Wavrunek** (ME-EM Ph.D. candidate, MSME '21, BSME '20), **Chuck Carey** (MSME '23, BSME '22) and **Paul van Susante** (Asst. Prof., ME-EM) in their story in the [2024 Michigan Tech Magazine](#). Or watch "[Space-Obsessed Huskies Are on a Mission](#)" on the Undergraduate Admissions "[Life at Tech](#)" webpage.

Michigan Tech Huskies shine on the 2023-24 All-Academic Team announced by the CCHA, with 21 student-athletes recognized for their outstanding academic achievements. Among them, **Kyle Kukkonen** (so., EME) and **Trevor Kukkonen** (jr., EME) were named CCHA Scholar-Athletes for maintaining a GPA of 3.50 or higher. Congratulations to our dedicated student-athletes for their academic excellence!

Dr. Paul van Susante (Asst. Prof, ME-EM) is leading the [MTU MINE AstroHuskies](#) team in their preparation for the [2024 Lunabotics competition](#). MTU MINE is one the university's Enterprise teams with multiple projects. The Lunabotics project team is tasked with designing, building, and testing a robot to compete against 44 other university teams nationwide. The robot must adhere to strict weight and size constraints while maximizing autonomy. During the competition, the robot will navigate through an obstacle zone to reach a construction area where it will excavate, transport, and deposit lunar simulant to construct a protective berm. This berm simulates a structure designed to shield lunar infrastructure from lunar regolith during landing and take-off. The team is enthusiastic about the challenge and eager to demonstrate their skills in the competition. In May, ten of the [Astro-Huskies team members](#) will travel Orlando for the Lunabotics Qualification Challenge at UCF's Center for Lunar & Asteroid Surface Science (CLASS), and then attend the on-site Challenge at the Kennedy Space Center.



Multiplanetary INnovation Enterprise (MINE) team at Michigan Tech

Student News

Talon Cole (jr., EME), **Connor Steer** (sr., EME), and **Ethan Mehren** (jr., EME) were featured in live segments reported by [WLUC TV6](#) during the final hours of the All-Nighter at Michigan Tech. The segments showcased several of the monthlong statue entries.

Evelyn James (sr., EME) was selected as the audience's choice at the 2024 Winter Carnival Royal Majesty coronation, as covered by [ABC 10](#) and the [Keweenaw Report](#).

Andrew Quillan (sr., EME) was interviewed by [WLUC TV6](#) in a broadcast segment about Michigan Tech's Spring Career Fair, held Tuesday (Feb. 13) at the SDC.

Alumni and Friends News, Accomplishments & Awards

Mike Bakk (BSME '01) was named as the new co-chair of Minnesota's Iron Ore Alliance, as highlighted by Northern Minnesota and northern Wisconsin's [BusinessNorth](#). Michigan Tech's association with this appointment was featured in the story. The alliance is dedicated to providing a unified voice for modern iron mining in the state.

Austin Gongs (BSME '18) and **Nathan Ackerman** (BSME '18) were quoted in a story by [UPWord](#) about the founding of their Hancock-based outdoor gear business, Chicken Trampler Ultralight Gear.

Jeffrey Pruetz (BSME '07), NVH and vehicle integration manager at FEV North America Inc., was a speaker for the webinar "Noise, Vibration, and Harshness Priorities for EVs," as reported by SAE's [Tech Briefs Magazine](#): Engineering Solutions for Design & Manufacturing. Michigan Tech's mention in the preview highlights Pruetz's involvement in the event.



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Alumni and Friends News, Accomplishments & Awards (cont'd)

Jordan Stank (BSME '09, MSME '11), a professional snowmobile hill climber, was quoted in a story by [The Daily Mining Gazette](#) about the cancellation of the Snowmobile and Snow Bike Hillclimb in South Range, Michigan, due to lack of snow. Jordan is one of only two Mid-America Snow & Terrain Expert Racers (MASTERS) that have advanced to the finals at the world championship hillclimb in Jackson, Wyoming.



Maurice M. "Morry" Taylor (BSME '68), chairman of Titan Industries and 1996 U.S. presidential candidate, advocates for a business-savvy leader in the White House, citing the need for practical solutions to national challenges. In a recent [DBusiness Magazine](#) profile by Dale Buss, Taylor's entrepreneurial journey and his enduring presence in both business and politics are highlighted. From his days as a manufacturer's sales rep to his transformation of Titan International into a \$5-billion enterprise, Taylor's influence extends beyond corporate boardrooms to the political arena. Taylor, now 79, seeks to shape policy and discourse through alternative means, including authoring a book aimed at providing insights for future political leaders.



University News & Awards

[Automotive Testing Technology International](#), [ADAS & Autonomous Vehicles International](#), and the [University of Michigan](#) mentioned Michigan Tech in coverage of the U.S. Army's new five-year agreement with the U-M's Automotive Research Center. Worth up to \$100 million, the agreement boosts work on autonomous vehicle technologies. MTU was listed among the center's participating institutions.



[Gov. Gretchen Whitmer](#), [UPWord](#) and the [Keweenaw Report](#) mentioned Tech in coverage of the state's new Michigan University Innovation Capital Fund and the Michigan University Innovation Capital Consortium. Driven by a partnership of six Michigan universities, including [Michigan Tech](#), the initiatives were created with a goal of supporting pre-seed startups and early-stage companies across the state. They will be administered by U-M's Innovation Partnerships, which recently received a \$5 million award from the Michigan Innovate Capital Fund to support the program.



The [Daily Mining Gazette](#) ran a story about the 2024 Maker Fest, held on March 23 at Houghton High School. The event celebrated the process of making and offered nearly 30 hands-on activities. Among them, one individual facilitated stop-motion filmmaking, while another offered 360-degree 3D scans of people's heads. Additionally, the [Society of Women Engineers](#) ran a booth on building paper circuits.



The [Big Rapids Pioneer](#) mentioned the [Blizzard Baja Enterprise's Winter Baja Race](#) in a feature story about the Ferris State University Baja Club. In the story, an FSU club member described the race's jumps and obstacles as a real test of car durability.



Michigan Technological University

The [Michigan Space Grant Consortium](#) announced its 2024 Award Recipients. Michigan Tech received a total of 14 awards, including 11 Graduate Fellowships, two Faculty Led Fellowships for Undergraduates, and one Hands-on NASA Oriented Experiences for Student Groups award.



The [Daily Mining Gazette](#) mentioned Michigan Tech in a story about the start of the season for Houghton's FIRST Robotics team. The team held a demo at the [Western U.P. STEM Fair and Festival](#) at the Memorial Union Building on March 16. Check out the team's [2024 robot reveal video](#) on their "[Superior Roboworks](#)" YouTube page.



[WOOD TV8](#) in Grand Rapids, MI, mentioned Michigan Tech and included a still image from the [Mont Ripley ski hill webcam](#) in a story about locations in the contiguous U.S. that have snow on the ground this February.



The [Daily Mining Gazette](#) covered Michigan Tech students' involvement in both the [Winter Carnival Stage Revue](#) and the [Ice Mass](#) at St. Albert the Great University Parish, alongside the [All-Nighter's challenges and successes](#). The [Gazette](#) and [WZMQ 19 News](#) both highlighted [Michigan Tech News'](#) report on the winning snow statues.

[WLUC TV6](#) provided live coverage from Michigan Tech post-All-Nighter, showcasing campus and the monthlong and one-night snow statues, with recognition for MTU Facilities Management and local public works departments. Additionally, they announced the [overall Carnival winners for 2024](#).





~ Promotions to Teaching Professor ~

The Mechanical Engineering-Engineering Mechanics department takes great pride in announcing the elevation to the rank of Teaching Professor of two members of our esteemed instructional track faculty, **Dr. Jaclyn E. Johnson** (MSME '08, PhD '11) and **Dr. Aneet D. Narendranath** (MSME '09, PhD '13).

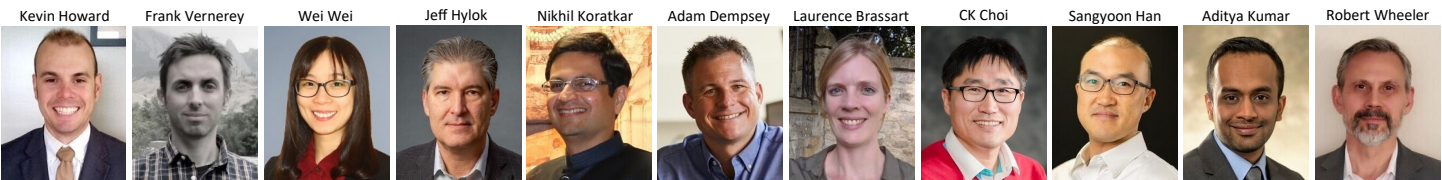
We extend our warmest congratulations to them for their exceptional accomplishments and eagerly anticipate their ongoing success and valuable contributions to our academic community.



ME-EM Graduate Seminar Speaker Series - January - April 2024

The [ME-EM Graduate Seminar Series](#) is offered as an opportunity for graduate students and faculty to broaden their knowledge beyond their specific area of research and/or studies. This is important at and beyond the graduate level where our activities are highly focused and specialized from a topical perspective. The Seminar Series Committee works diligently to provide a full agenda of speakers who are known nationally and internationally and represent academia, industry and government. The intention is to balance the topics across all areas of the Department while also integrating a few speakers who traverse the traditional ME-EM boundary into new and exciting areas.

- * **Kevin Howard, Ph.D.**, Aerodynamics Technical Expert, Ford Motor Co., | [“Design of Experiments and Key Considerations for Machine Learning in Highly Non-linear Problems.”](#)
- * **Frank Vernerey, Ph.D.**, Professor, Mechanical Engineering University of Colorado, Boulder | [“Collective Mechanics of Fire-Ant Swarms: Materials with Swarm Intelligence.”](#)
- * **Wei Wei, Ph.D.**, Associate Professor, Mechanical Engineering Wichita State University | [“3D Carbon Nanomaterials for New Generation Solar Cells”](#).
- * **Jeff Hylok, MSME**, Principal Engineer, Los Alamos National Laboratory | [“After Oppenheimer: The Los Alamos Mission in the Modern Day.”](#)
- * **Nikhil A. Koratkar, Ph.D.**, John A. Clark & Edward T. Crossan Professor, Rensselaer Polytechnic Institute (RPI) | [“Battery Electrodes: Nano vs Micro-Structuring.”](#)
- * **Adam Dempsey, Ph.D.**, Assistant Professor, Marquette University | [“Fuel Flexible Mixing-Controlled Combustion System for Heavy- Duty Engines Using Low Carbon Alternative Fuels.”](#)
- * **Laurence Brassart, Ph.D.**, Associate Professor in the Solid Mechanics & Materials Group of the Department of Engineering Science at the University of Oxford | [“Coupled Degradation and Mechanics in Polymers and Gels.”](#)
- * **Chang Kyoung “CK” Choi, PhD**, Associate Professor, Mechanical Engineering and Engineering Mechanics, Michigan Technological University | [“Cellular Agriculture: Pioneering the Future of Sustainable and Zoonotic Disease-Resilient Food Systems.”](#)
- * **Sangyoon J. Han, PhD**, Assistant Professor, Biomedical Engineering, Michigan Technological | [“Force, Stiffness, and Cell Behavior.”](#)
- * **Aditya Kumar, PhD**, Assistant Professor of Structural Mechanics, School of Civil and Environmental Engineering, Georgia Tech | [“Frontal Polymerization Enabled Patterning and Additive Manufacturing of Thermoset Polymers.”](#)
- * **Robert Wheeler, MSME**, Vice President, Hankook Tire and Technology | [“Engineering Finite Element Tires for Predicting Vibration Performance.”](#)



Current Contracts and Grants

Bar-Ziv, Ezra (PI, Professor, ME-EM (APSRC)) and **Shreyas Kolapkar** (Co-PI, Res Eng, ME-EM/APSRC); “Solvent Targeted Recovery and Precipitation (STRAP) For Plastic Removal from Municipal Solid Waste (MSW)”; sponsor: Battelle Energy Alliance LLC / Idaho National Laboratory; additional funds added to ongoing award: \$199,314.00.

Masoud, Hassan (PI, Associate Professor, ME-EM (GLRC)); “Rapid Seedling: Harnessing Kirigami-Inspired Composites for Wave Energy Conversion”; sponsor: Michigan Technological University/GLRC; total award: \$10,000.

Miers, Scott (PI, Associate Professor, ME-EM (APSRC)); “Alternative Fuels Research with Argonne National Laboratory”; sponsor: Argonne National Laboratory; total award: \$27,198.

Miers, Scott (PI, Associate Professor, ME-EM (APSRC)); “Validation & Testing of the Mini-PEMS for Snowmobile Applications”; sponsor: Environment and Climate Change Canada; total award: \$50,182.

Naber, Jeffrey (PI, Professor, ME-EM (APSRC)); “Initial Studies to determine instrumentation, data acquisition, and methods for characterizing the thermal runaway of an EV pack”; sponsor: Stellantis; total award: \$10,000.

Odegard, Gregory (PI, Professor, ME-EM (MARC)); “Molecular Modeling of Shrinkage, Strength, and Permeability in Thermoplastic Composites”; sponsor: National Aeronautics and Space Administration (NASA); total award: \$50,000.

Odegard, Gregory (PI, Professor, ME-EM (MARC)); “Molecular modeling of carbon-carbon materials”; sponsor: Ingenium Scientific Inc.; total award: \$120,000.

Parker, Gordon (PI, Professor, ME-EM (MARC)); “Nonlinear Hydrodynamic Modeling”; sponsor: Sandia National Laboratories; total award: \$69,532.

Parker, Gordon (PI, Professor, ME-EM (MARC)); “Machine Learning for Condition Based Maintenance”; sponsor: Advanced Technology and Research Corp; total award: \$50,000.

Weaver, Wayne (PI, Professor, ME-EM (MARC)); “Advanced Modeling, Controls, and Power Electronics Testing for Large Penetration of Renewable Energy Grid Integration - PART 01”; sponsor: Sandia National Laboratories; total award: \$100,000.

Weaver, Wayne (PI, Professor, ME-EM (MARC)); “Advanced Modeling, Controls, and Power Electronics Testing for Large Penetration of Renewable Energy Grid Integration - PART 02”; sponsor: Sandia National Laboratories; total award: \$120,000.

CAPSTONE OR NER

Senior Capstone Design Update

Extending our sincere gratitude to all our partners who collaborated with us this year to educate aspiring engineers. Furthermore, we would like to acknowledge some of the companies who have worked with our students on various projects:

John Deere - Construction & Forestry - Mr. Dan Watson
- Project Name: *ADT Carryback Reduction*

Stryker - Mr. James Novorita
- Project Name: *Not disclosed*

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

Envision long-term; focus on mid-term; deal with near-term... in that order if you can.

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