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9-2009

ME-EM eNewsBrief, September 2009

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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Department of Mechanical Engineering—Engineering Mechanics

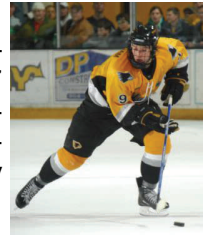


Greetings from William (Bill) W. Predebon, Chair, Department of Mechanical Engineering-Engineering Mechanics. For the latest news and information about our faculty, students, and staff please visit our web site at <http://www.me.mtu.edu/>.

Upcoming Events

ME-EM Annual Winter Carnival Hockey Social:

8th Annual ME-EM Alumni Winter Carnival Hockey Social on Saturday, February 6th, MTU versus Duluth (Winter Carnival), 5:07 PM start time in the MacInnes Skybox of the Student Development Complex (SDC). RSVPs are required to Kathy at kagoulet@mtu.edu or 906-487-2911. Space is very limited, please reserve your ticket soon.



MEEM Department Chair Travel

When on travel for the Department, Dr. Predebon visits with alumni to get their feedback on our programs and their career and to give an update on the Department and University. Please let the Department know if you would be available for a visit when he is in your area. (906) 487-2911.

*The week of November 16th - Orlando, FL, for the ASME Meeting

Alumni and Friends News & Accomplishments & Awards

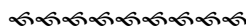
It is my intent to highlight alumni accomplishments on a regular basis. I would like to hear from you about your accomplishments and those of other Michigan Tech ME -EM alumni who have achieved recognition. Please email me this information at wwpredeb@mtu.edu or Kathy at kagoulet@mtu.edu.

Donald Boldt (BSME '58) has been named to the Michigan Tech Sports Hall of Fame Class of 2009. Don played football at Tech from 1954-57, having been named both a most valuable player and the top defensive player during his playing time. He stayed on for one year as assistant coach after graduation.

Two Michigan Tech ME - EM alumni returned to the ME - EM Department at Michigan Tech to give seminars.

On Monday September 28, 2009, **John (BSME '64) and Cathi Drake** hosted a one-hour seminar: "Entrepreneurship: What It Is, What It Takes, What It Returns". John is the owner/chairman (retired) of Drake Manufacturing Services and sponsor of the ME - EM John and Cathi Drake Endowed Professorship

On October 8, 2009, **Dr. Terry Woychowski (BSME '78)**, Vice President, Global Vehicle Program Management at GM, gave a seminar entitled "Leadership - Changing the World Through Influence".



Kari Brown (BSME '06, MSME '08) has been named National Secretary at the National Society of Black Engineers.

The Denso Foundation has awarded the ME-EM Department's Advanced Motorsports Enterprise \$50,000 in recognition that Michigan Tech provides "many opportunities for engineering students to put into practice the skills and leadership needed by industry."

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Alumni and Friends News & Accomplishments & Awards continued

Chris Klaes (BSME '91) has been named to the 2009 class of the Michigan Tech Sports Hall of Fame. He participated in track and cross country from 1987 to 1990 and is one of the most decorated runners in Michigan Tech history. He still holds the university record in the 3,000-meter steeplechase and was named the GLIAC outdoor track MVP in 1990. He was also a GLIAC indoor champion in the 3,000 meters in 1990.

GS Engineering of Houghton, MI, has been awarded a \$25 million, five year contract with US Special Operations Command. **Glen Simula (BSME '91)** is the President of GS Engineering.

Dr. Terry Woychowski has been elected vice president of the Engineering Society of Detroit.

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**Dr. Terry Woychowski** has been named vice president, global vehicle program management at GM. He has been with GM for more than 29 years. He has been chief engineer for GM's award-winning line of full-size pickups and sport-utility vehicles since 1997, and for the past four years, he has also served in the leadership role for the regional chief engineers.

PARTsolution was featured in the article "Find a Part" in the August 24th edition of Aviation Week.com in respect to PARTsolution's multiyear agreement with Boeing for software and services for their 3D catalog management. **Timothy Thomas (BSME '81)** is CEO of PARTsolution.

## University News/ Awards



Michigan Tech and the US Army Corps of Engineers' Environmental Laboratory in Vicksburg have signed an educational and research partnership agreement that opens the door to a broad range of research projects, faculty exchanges and student internships. The cross-disciplinary research and education that Michigan Tech and the Corps of Engineers' Engineer Research and Development Center Environmental Laboratory (ERDC-EL) will conduct focuses on protection and restoration of the Great Lakes.

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The semi-annual Michigan Tech Career Fair was held on Tuesday, September 29, 2009. One hundred and fifty five companies were represented on campus which was down from the 295 last year but was actually better than what was anticipated. Enrollment for the fall 2009

semester rose this year to 7,132 an increase of 118 students from last fall's number. The increase is a result in a surge in graduate enrollment.

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Michigan Tech was recognized by The Princeton Review in its annual college guide, "The Best 371 Colleges," which was released Monday, July 27, 2009. The information is based on The Princeton Review's survey of 122,000 students (about 325 per campus on average) attending the colleges in the book. Only about 15 percent of America's 2,500 four-year colleges and two Canadian colleges are included. Students graded the University in a number of categories on a scale of 60 to 99. The University received high marks in fire safety (94), "green" rating for environmental policies (75), and quality of life (83). The students also cited great athletic facilities, career services, and real hands-on-learning experiences.

Michigan Tech received the inaugural Great Lakes Intercollegiate Athletic Conference Sportsmanship Award

during the league's recent executive council meeting. The award honors the institution in the GLIAC whose student-athletes, coaches, administrators and fans best display sportsmanship toward visiting teams. Coaches in each of the league's sports where there is a round robin schedule ranked their top three choices to receive the award.

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Michigan Tech is receiving almost \$3 million in federal funds from the American Reinvestment and Recovery Act as a part of the U.S. Department of Energy's Electric Drive Vehicle Battery and Component Manufacturing Initiative. Michigan Tech will work with industry partners, including AVL, GM, and Eaton, to develop undergraduate and graduate curricula, including a certificate program in hybrid electric vehicles. Faculty members involved in this multidisciplinary program are PI - **Carl Anderson (ME-EM)** and co-PI's: **Jeffrey Allen, John Beard, Bo Chen, Jeffrey Naber,**

Chris Passerello, and Jeremy Worm (ME - EM); Jason Keith (Chem Eng); Leonard Bohmann, Bruce Mork, and Wayne Weaver (ECE); Steve Hackney (MSE); and Jay Meldrum (KRC).

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Michigan Tech's award of nearly \$3 million in stimulus money was highlighted in Great Lakes IT Report. Read the article at: <http://www.wwj.com/Michigan-Tech-Gives-Details-On-Hybrid--Electric-Fu/4955586>

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Both the men's and women's track and field teams at Michigan Tech were named Scholar Teams by the United States Track and Field and Cross Country Coaches Association. The women's team posted a 3.43 cumulative grade point average to finish 10th in the nation and second-best among Great Lakes Intercollegiate Athletic Conference teams. The men's team finished 24th in the nation and sixth among GLIAC schools with a 3.03 cumulative grade point average. To be eligible for the award, a team must carry a minimum 3.0 GPA.

Department Accomplishments

"Teaming Up to Teach", an article written by Michigan Tech senior writer in Marketing and Communications, Marcia Goodrich, highlighting the 3-credit course "Advanced Propulsion for Hybrids" was published in Technology Century, the official publication of the Engineering Society of Detroit (ESD). The article describes the partnership between GM,

Michigan Tech, and ESD to provide the graduate level course to laid off engineers essentially free of charge (Michigan Tech provided full scholarships for the laid off engineers). The partnership was lead by Dr. Terry Woychowski from GM, ESD, and Michigan Tech.



General Motors has donated two Saturn Vue hybrids and a Chevrolet Malibu hybrid to

Michigan Tech in support of research and education as well as for hands-on instruction in an advanced propulsion technology course for working engineers being offered in Detroit this fall by Michigan Tech, AVL and the Engineering Society of Detroit (ESD). Dr. Jeffrey Naber (associate professor, ME-EM) is the lead on the project together with other faculty (mentioned above) for the course , modeled

after a breakthrough course that the University, GM and ESD offered to displaced automotive engineers last spring. The new course is offered with full tuition support via federal funds through the Michigan Department of Energy, Labor and Economic Growth and the Michigan Academy for Green Mobility. Read more at: <http://www.admin.mtu.edu/urel/today/previous.php?issue=20090813>.

New Faculty and Staff

Dr. Seong-Young Lee joined the Department as an assistant professor in the fall of 2008. He earned his Ph.D. in Mechanical Engineering from the Pennsylvania State University in 1998. He comes to Michigan Tech from the Pennsylvania State University where he was research associate for seven years. His areas of expertise include spray combustion, fuel flexibilities, soot emissions, internal combustion engines, gas turbine engine, laser-based combustion



Dr. Charles H. Margraves



joined the Department as a lecturer the fall of 2008. He earned his Ph.D. in Mechanical Engineering from the University of Tennessee in 2008. His area of interest include visualization and analysis of thermal, fluid, and bio-processes at the micro/nano-level, including single particle tracking, using multiple microscopy techniques.

Dr. Scott A. Miers

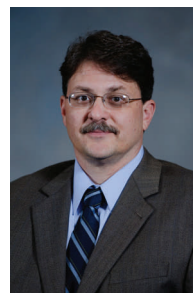


joined the Department as an assistant professor in the fall of 2008. He earned his Ph.D. in Mechanical Engineering from Michigan Techn 2004. He comes to Michigan Tech from Argonne National Laboratory where he was a post doctoral researcher for three years in the Engines and Emissions Research section. His areas of expertise include alternative and renewable transportation fuels, internal combustion engine efficiency, performance and emissions, wireless data acquisition techniques, combustion visualization.

Dr. Chang Kyoung (CK) Choi joined the Department as an assistant professor in January of 2009. He earned his first Ph.D. in Mechanical Engineering from Texas A&M University in 2004 and a second Ph.D. in Mechanical, Aerospace, and Biomedical Engineering from the University of Tennessee in 2007. He comes to us from Oakridge National Laboratory where he was a post doctoral researcher in the Biosciences Division for a year and prior to that a post doctoral researcher at the University of Tennessee for a year. His areas of expertise include opto-electric biosensor, micro-/nano-fabrication, microfluidics, microscopic optical imaging, synthetic biology, and computer simulation (CFD).



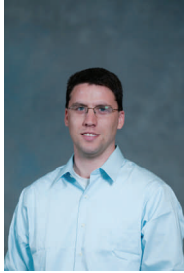
Dr. James P. De Clerck



joined the Department as a professor of practice this fall. He earned his Ph.D. in Engineering Mechanics from Michigan Tech in 1991. He comes to Michigan Tech after eighteen years with General Motors, his last position as a lead engineer in structural vibration. His areas of expertise include noise and vibration, mechanical vibrations, structural dynamics, mechanical design and analytical and experimental modal analysis.

New Faculty and Staff —continued

Dr. John D. Hill joined the Department as an assistant professor this fall. He earned his Ph.D. in Industrial Engineering from the University of Iowa in 2006. He comes to Michigan Tech from Eaton Corporation where he was an engineering manager in research and design for two years. He was also a post doctoral researcher at the University of Iowa for a year before that. His areas of interest include human factors, transportation safety and policy, and service systems.



Joan Tapani

joined the Department as an office assistant this summer. She was previously an office assistant for the Henes Chair Professor at Michigan Tech. Joan has an associate degree from Finlandia



Faculty/Staff Awards/Accomplishments

Lake Superior Magazine quotes faculty members **Dr. Jeffrey Naber (associate professor, ME-EM)** and David Shonnoard (Robbins Chair Professor, Chemical Engineering) in "Wood to Wheels: MTU's Drive toward a Greener Future," which appears in its September edition. The story, written by freelancer Tom Wilsowske, provides an overview of current research, including Naber's efforts to develop greener flex-fuel hybrid engines and Shonnoard's work developing new biofuel technologies.

Dr. Madhukar Vable (associate professor, ME-EM) has published the second edition of the undergraduate textbook "Mechanics of Materials" online. The textbook can be seen in its entirety at <http://www.me.mtu.edu/~mavable/MoM2nd.htm>.



Dr. Jeffrey Naber represented the University in Detroit on Wednesday, August 5, 2009 at the Vice President of the United States announcement of the \$2.98 billion stimulus recipients. He met with the Vice President and participated in a round table on technology, education, and powertrain.

Current Contracts and Grants

Allen, Jeffrey (PI, ME-EM), "Stability, Cellular Structure, and Heat Transfer of Evaporating Films in Normal and Reduced Gravity", sponsor: National Aeronautics and Space Administration, total award amount: \$120,602.



Chen, Bo (PI, ME-EM), "REF-RS: Immune-Inspired Design Methodology for Building Autonomous Structural Health Monitoring Systems", sponsor: University of Michigan - Michigan Space Grant Consortium, total award amount: \$9,500.



Dai, Qingli (Co-PI, ME-EM), "Microfluidic Fabrication of Self-Healing Microfibers for Composite Construction Materials", sponsor: National Science Foundation, total award amount: \$365,938.

D'Souza, Roshan M. (PI, ME-EM), "CRI II - New: Data-Parallel Platform for Large-Scale Simulation of Agent Based Models in Systems Biology", sponsor: National Science Foundation, total award amount: \$349,910.



Friedrich, Craig R. (PI, ME-EM); Allen, Jeffrey; Choi, Chang-Kyoung (Co-PIs, ME-EM), "REF-IE: Total Internal Reflection Fluorescence Microscopy Imaging Nanoparticles, Biomaterials, and Bio-Nano Hybrid", sponsor: REF - State of MI, total award amount: \$27,359.



Lee, Seong-Young (PI, ME-EM), "REF-RS: Investigation of Direct Injection Flash Boiling Spray in a Combustion Vessel", sponsor: REF - State of MI, total award amount: \$5,500

Lee, Seong-Young (PI, ME-EM); Naber, Jeffery (Co-PI, ME-EM), "Imaging ignition and Flame Kernel Development", sponsor: E3 Sparkplugs, total award amount: \$12,900.



Meng, Desheng (PI, ME-EM), "Microfluidic Fabrication of Self-Healing Microfibers for Composite Construction Materials", sponsor: National Science Foundation, total award amount: \$365,938.



Miers, Scott (PI, ME-EM), "REF-RS: Development of a Novel nucleate Boiling Identification Technique to Optimize Internal Combustion Engine Thermal Management", sponsor: REF - State of MI, total award amount: \$7,000.

Miller, Michele (PI, ME-EM); Gershenson, John; Margraves, Charles; Miskioglu, Ibrahim; Parker, Gordon G. (Co-PIs, ME-EM), "Weaving Threads of Sustainability into the Fabric of the Mechanical Engineering Curriculum: Impacting the Fundamental Manner in Which Students Solve Problems", sponsor: National Science Foundation, total award amount: \$144,604.

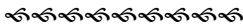


Mukherjee, Abhijit (PI, ME-EM), "REF-RS: Experimental Investigation of Bio-Mimetic Water Management in a Proton Exchange Membrane Fuel Cell", sponsor: REF - State of MI, total award amount: \$15,000.



Current Contracts and Grants—continued

Naber, Jeffery (PI, ME-EM); Worm, Jeremy; (Co-PI, ME-EM), "Characterization of Combustion in and SI Engine with Water Injection", sponsor: Nostrium Energy, total award amount: \$29,921.



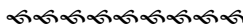
Rao, Mohan (PI, ME-EM), Willemssen, Andrew (Co-PI, MS student, ME-EM), "Effects of Dispersed Carbon Nanotubes on Acoustic Properties of Polymer Foams", sponsor: National Aeronautics and Space Administration, total award amount: \$30,000.



Worm, Jeremy (PI, ME-EM); Blough, Jason; Naber, Jeffrey (Co-PIs, ME-EM), "Development of a Trilateral Partnership Between Michigan Tech, AVL, and GM with an Integral Laboratory to Explore and Incubate Innovative Powertrains", sponsor: University of Michigan - Michigan Initiative for Innovation & Entrepreneurship, total award amount: \$227,100.



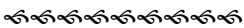
Odegard, Gregory M. (PI, ME-EM), "Multiscale Modeling of Polymer Nanocomposites", sponsor: NASA Langley Research Center, total award amount: \$72,477.



Shahbazian Yassar, Reza (PI, ME-EM), "A New Perspective on Energy Harvesting Nanowires: The Role of Chemistry and Structures of Nanowires", sponsor: National Science Foundation, total award amount: \$327,763.



Worm, Jeremy (PI, ME-EM); Miers, Scott; Naber, Jeffrey (Co-PIs, ME-EM), "Investigation of Extreme Inlet Air Temperature of Thermal Efficiency of a Flex-Fueled SI Engine",



Ponta, Fernando (PI, ME-EM), "A Fluid-Structure Interaction Study in Wind-Turbine Blades", sponsor: National Science Foundation, total award amount: \$204,780.

Sutherland, John W. (PI, ME-EM), "Feedstock Supply Chain", sponsor: Frontier Renewable Resources, total award amount: \$495,607.

Faculty and Student Invention Disclosures

Dr. Ossama Abdelkhalik (assistant professor, ME - EM) and **Dr. Seyed Zekavat (associate professor, Electrical and Computer Engineering)** have filed an invention disclosure, "Space-based solar power grids".



Dr. John Johnson (professor emeritus and research professor, ME-EM), Jason Yang (professor, ME-EM), Kiram Premchand (Ph.D. candidate, ME - EM) and **Harsha Surehalli (MS student, ME-EM)** have filed an invention disclosure, "Updated FORTRAN and MATLAB Simulink One-Dimensional Catalyzed Wall-Flow Particulate Filter Software".



Dr Jeffrey Naber (associate professor, ME-EM), Jeremy Worm (Research Engineer/Grant Writer, ME-EM), and **Wayne Weaver (assistant professor, Electrical and Computer Engineering)** have filed an invention disclosure, "A Vehicle Docking Station".

Student Competitions and Team



Michigan Tech has won the SAE International's first video contest. The contest challenged SAE Sections or collegiate chapters to create and submit videos depicting the value of SAE International membership and participation. The videos were to be a maximum of three minutes and needed to end with the phrase, "This is our SAE!" The team was honored at an Awards Luncheon on October 7th in Rosemont, IL. See the video at: <http://www.techtube.mtu.edu/watch.php?v=531>.

Student Accomplishments and Awards

Zachary Edel (Ph.D. candidate, ME-EM) has received honorable mention for the NSF Graduate Research Fellowship Program. His advisor is **Dr. Abhijit Mukherjee (assistant professor, ME-EM)**.

Andrew Willemsen (MS student, ME-EM) has received a \$30,000 fellowship from NASA for his project "Effects of Dispersed Carbon Nanotubes on Acoustic Properties of Polymer Foams." His advisor is **Dr. Mohan Rao (professor, ME-EM)**.

