

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 Reunion Cruise:

Please join us aboard the Ranger III for an afternoon cruise down the Portage Canal on Thursday, August 5th. Board the Ranger III at 12:30 p.m. at the National Park Service dock east of the Dee Stadium and right behind the Franklin Square Inn. We depart at 1:00 p.m. and will return at 3:30 p.m. (plenty of time to attend the Pasty Picnic). Space is limited and reservations are required so RSVP as soon as possible to kagoulet@mtu.edu or phone (906) 487-2551. Please note that the Ranger cruise is a change from last year and from what was advertised in Reunion materials. Refreshments and the cruise are compliments of the ME-EM Department.



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. Dr. Predebon will be traveling to Vancouver, British Columbia, November 12-18, 2010 for the ASME International Mechanical Engineering Congress and Exposition. Please call (906) 487-2911 to arrange a meeting.

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2009 Annual Report

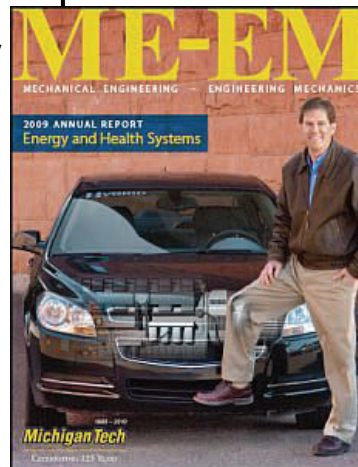
Annual Report Corrections

The following alumni donors were inadvertently left out of our 2009 Annual Report. We deeply apologize for the error.

In the \$1,000—\$4,999 category
Bernard & Marilyn Finn
Charles & Marilyn Knauer
Andrew Kolosiuk
Timothy & Beverly Rosemeyer
Gilbert & Joan Wirkner

In the \$500—\$999 Category
Ronald & Katherine Settimi
Robert & Elizabeth Wise

The Department of Mechanical



Engineering—Engineering Mechanics' 2009 Annual report has been mailed. If you have not received one and would like to, please contact us at:

ME-EM
1400 Townsend Dr.
815 ME-EM
Houghton, MI
49931

or call:
(906) 487-2551

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.

bureaucratic problems faced at GM. Hear the broadcast at: <http://www.thisamericanlife.org/radio-archives/episode/403/nummi?bypass=true>.



Kirby Baumgard (PhD Environmental Engineering and ME-EM External Advisory Board member), has been named Project Manager-Advanced Engine Technology at Deere & Company.



Elzbieta G. Berak (PhD, Engineering Mechanics, '85) was inducted into the Michigan Tech Presidential Council of Alumnae on April 16, 2010. She is currently a senior engineer with the Exelon Corporation in Chicago, IL.

Wendy L. Kram (BSME '91) was inducted into the Michigan Tech Presidential Council of Alumnae on April 16, 2010. She is currently the founder of Propel Business Leadership Program and Entrespect as well as president of Edgeston Consulting Inc. all of Eagan, MN.

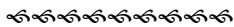


Geoffrey Weller (BSME '75) was interviewed on the NPR "This American Life" regarding GM's NUMMI Plant where he discussed the institutional/

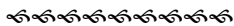
Dr. Terry Woychowski (BSME '78), vice president, Global Vehicle Program Management, GM, was highlighted in the June 24th edition of the Detroit Free Press for his personal foundation's work in Africa. The foundation supported a senior design project that built a human powered grain mill for use in Africa. Read the article at <http://www.freep.com/print/article/20100624/BUSINESS01/6240450/GM-know-how-helps-Africans>

Faculty/Staff Awards & Accomplishments

Dr. Ossama Abdelkhalik (assistant professor, ME-EM) has been appointed a member on the International Advisory Committee of the International Islamic University Malaysia Engineering Journal.

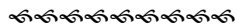


Dr. Jeffrey S. Allen (associate professor, ME-EM) and **Ezequiel Medici** (PhD candidate, ME-EM) have received the 2010 Bhakta Rath Research Award. They are the first recipients of the award which recognizes excellence in scientific and engineering research in the field of physical and natural sciences and engineering. It was made possible by an endowment from Bhakta B. Rath and his wife, Sushama Rath. The award recognizes a doctoral student at Michigan Tech and his or her faculty advisor for "exceptional research of particular value that anticipates the future needs of the nation while supporting advances in emerging technology."

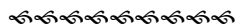


Dr. John H. Johnson (Presidential Professor Emeriti, ME-EM) had his service on two committees that evaluated various technologies to reduce

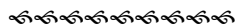
and improve fuel consumption highlighted in the June 16, 2010 issue of Tech Today. One focused on medium- and heavy-duty vehicles, such as tractor-trailers, transit buses and work trucks. The other addressed fuel consumption in passenger cars, sport-utility vehicles, minivans and other light-duty vehicles. Read the article at: <http://www.admin.mtu.edu/urel/ttoday/previous.php?issue=20100616>.



Dr. Charles H. Margraves (lecturer, ME-EM) received the 2010 Distinguished Teaching Award in the Assistant Professor, Professor of Practice, or Lecturer category (only one is awarded per year) after only two years at Michigan Tech.



On May 4, 2010, the following ME-EM faculty and staff were honored for their service to Michigan Tech: **Ibrahim Miskioglu** (associate professor), **Sheryl A. Sorby** (professor), and **Madhukar A. Vable** (associate professor) were honored for 25 years of service. **Robert L. Whipple** (research engineer/scientist II) for 30 years of service.



Dr. Jeffrey D. Naber (associate professor, ME-EM) received an SAE International (Society of Automotive Engineers)

2010 Forest R. McFarland Award on April 13, 2010. Naber is director of the Advanced Power Systems Research Center. The McFarland award recognizes individuals for "outstanding contributions to the SAE Engineering Meetings Board and the development and dissemination of information through technical meetings, conferences and professional development programs, or for contributions in facilitating or enhancing the interchange of technical information."



Dr. Jeffrey D. Naber received one of the Engineering Society of Detroit's (ESD) Distinguished Service Awards on June 23, 2010. Dr. Naber taught a graduate course in Detroit in advanced hybrid electric propulsion technology for displaced and working engineers as a part of the tri-lateral partnership between GM, Michigan Tech and ESD.



Dr. Sheryl A. Sorby (professor, ME-EM) had her research cited in "Why So Few? Women in Science, Technology, Engineering, and Mathematics highlighted on the AAUW website. Read the article at: <http://www.aauw.org/learn/research/whysofew.cfm>.

Current Contracts and Grants

Jeffrey S. Allen (PI, ME-EM) and **Reza Shahbazian Yassar** (Co-PI, ME-EM); "Development of Micro-structural Mitigation Strategies for PEM Fuel Cells: Morphological Simulations and Experimental Approaches", sponsor: Ballard Power Systems; total award amount: \$529,936.

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**Tammy L. Haut Donahue** (PI, ME-EM) and **Adam Abraham** (Co-PI, Ph.D. student, ME-EM); "Dynamic Gait Replication of Normal Loading and Disuse of the Human Knee", sponsor: University of Michigan - Michigan Space Grant Consortium; total award amount: \$5,000.

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John Hill (PI, ME-EM); "Identifying Costs and Funding Alternatives for Equipping Operating While Intoxicated (OWI) Offenders with Ignition Interlock Devices", sponsor: Wisconsin Department of Transportation; total award amount: \$23,112.

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**L. Brad King** (PI, ME-EM) and **Ben Gerhardt** (Co-PI, sr., ME-EM); "Photogrammetrics Small Unmanned Aerial Vehicle (PSUAV) - Aerospace

Enterprise", sponsor: University of Michigan - Michigan Space Grant Consortium; total award amount: \$2,500.

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L. Brad King (PI, ME-EM) and **Phillip Hohnstadt** (Co-PI, sr., ME-EM); "Oculus - ASR Nanosatellite", sponsor: University of Michigan - Michigan Space Grant Consortium; total award amount: \$2,500.

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**Seong-Young Lee** (PI, ME-EM) and **Andrew Ramsey** (Co-PI, sr., ME-EM); "Investigation of Combustion Instabilities in Lean-Premixed Gas Turbine Combustors", sponsor: University of Michigan - Michigan Space Grant Consortium; total award amount: \$2,500.

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Scott Miers (PI, ME-EM); "Analysis of Ranking Cycle Waste Heat Recovery System Using Simulation Tools", sponsor: Carbontec; total award amount: \$21,729.

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**Jeffrey D. Naber** (PI, ME-EM) and **Jeremy Worm** (Co-PI, ME-EM);

"Biomass Combustion Studies at L'Anse Warden Electric Company LLC (LWEC)", sponsor: L'Anse Warden Electric Company LLC; total award amount: \$23,071.

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Jeffrey D Naber (PI, ME-EM) and **Karthik Krishna** (Co-PI, ME-EM); "Market Trading Optimization", sponsor: White Pine Electric Power, LLC; total award amount: \$32,993.

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**Amitabh Narain** (PI, ME-EM); "Ground-Based Experimental and Computational Investigations of Shear Driven Internal Condensing/Boiling Flows for Flight Experiments and Space-Based Two-Phase Systems", sponsor: NASA Glenn Research Center; total award amount: \$100,000.

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Sheryl A. Sorby (PI, ME-EM) and **Tammy L. Haut Donahue** (Co-PI, ME-EM); "Strategies for Support of the STEP Program", sponsor: National Science Foundation; total award amount: \$351,371.



University News/Awards

Michigan Tech was recognized as one of eight finalists nationwide for the 2010 SunGard Higher Education Award for Institutional Performance. The honor recognizes Tech's ASPIRE (Accounting for Space, People, Indexes, Research and Equipment) project. The space inventory and management initiative was a joint effort of Accounting Services, Institutional Analysis, Telecommunications, Facilities Management and the Univer-

sity Space Committee. It is part of AQIP (Academic Quality Improvement Program), an alternative university accreditation process in which Michigan Tech participates.

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The Michigan Tech SAE Collegiate Branch was selected to receive the SAE/Honeywell 2009 Outstanding Collegiate Branch Award. In recognition they received a \$850 check and a framed certificate. The award was presented at the SAE 2010 World Congress and recognizes SAE Collegiate Branches for exemplary performance in the areas of technical meetings, net-

working opportunities, Collegiate Design Series competitions, membership and recruitment, and community service programs. The faculty advisor is **Dr. Jason Blough** (associate professor, ME-EM).

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Women's soccer has been added to the list of athletics offered at Michigan Tech. Coach Michelle Jacob has announced that seven players have signed National Letters of Intent to join the team for its inaugural season. Tech will host Concordia-St. Paul on September 2, 2010 for the first game in the program's history.

Student Competitions and Team Awards

The Michigan Tech Undergraduate Expo was held on April 19, 2010, on the Michigan Tech campus. The following Mechanical Engineering teams took home honors:

Senior Design 2nd place

Team 125, Tailings Slope Sustainment System
Team Members: **Jim Boex, Tyler Bushelle, Dave Flessert, Jake Gatien, Brian Skauge, Nate Thomas**
Advisor: **Mike LaCourt** (research scientist, ME-EM)

3rd place

Team 102, Portable Trap Thrower (tied)
Team Members: **Sam Handschke, Kevin Moran, Tim Olson, Ryan Szpara, and Ryan Ward**
Advisor: **Dr. Chris Passerello** (professor, ME-EM)

Enterprise 1st place

Team 308, Consumer Product Manufacturing.
Team co-leader was **Ben Kusterer** (sr., ME-EM)

2nd place

Michigan Tech Blue Marble Security Enterprise team.
Team co-leader was **David Thunes** (sr., ME-EM).



The International Senior Design Team won national honorable mention at the National Sustainability Design Expo held in Washington, D.C on April 24 - 25, 2010 for their Pit Toilet project. The event was sponsored by the US Environmental Protection Agency. Team members are Ashley Thode (Civil Eng), Krissy Guzak, Cara Hanson, and Kim Landick (Env. Eng.), **Craig Gossen** and **Stephen Marek** (ME-EM). The faculty advisors are Dr. David Watkins (associate professor) and Dr. Kurt Paterson, (assistant professor) - Civil and Environmental Engineering; and **Dr. Donna Michalek** (associate professor - ME-EM and assistant provost). Read the article at: <http://www.mtu.edu/news/stories/2010/april/story25807.html>.



Senior Design Team 1, had their project, "Biodegradable Clay Pigeons" highlighted in the April 16, 2010 issue of Tech Today. The Team has devised a pigeon that is made of three corn-based ingredients and is biodegradable to hopefully replace the current clay pigeons that are made of tar, pitch, and limestone and are not biodegradable. The team consists of ME seniors **Simon Dezelski, Robert Gisich, Tyler Hendrickson, Graig Vansickle, and Qiao Zhou**. Their advisor is **Dr. Charles Margraves** (lecturer, ME-EM). Read the article at: <http://www.admin.mtu.edu/urel/ttoday/previous.php?issue=20100416>.

The following teams received the 2010 Future Innovators Award at the Michigan Tech Undergraduate Expo. This award is voted upon by the more than 100 high school students and their teachers from L'Anse and Dollar Bay who attended the Michigan Tech Undergraduate Expo. All participate in the Michigan Tech GEAR UP program.

Senior Design - Display Device

Team Members: **Eric Diehr, Matt Peterson, Genevieve Taylor, and Will Whipple**, ME-EM

Advisors: **Dr. James De Clerck** (professor of practice, ME-EM) and **Prof. Charles Van Karsen** (associate professor and Associate Chair and Director of Undergraduate Studies, ME-EM)

Enterprise - Nanotech Enterprise

Team Leaders: **Echoe Bouta**, Biomedical Engineering, and **Greg Teeters**, ME-EM

Advisor: **Dr. John A. Jaszczak**, Physics



See short video clips of the 2010 Mechanical Engineering Senior Capstone Design projects at: http://www.youtube.com/view_play_list?p=1C1640FBF9272F5E

CAPSTONE

OR R N Z R

Nineteen Capstone Design projects were completed successfully this past April and another nine are at their halfway point, having started in January. A good number of dedicated students are working on these projects over the summer. One very interesting entrepreneurial project is continuing this summer with business students from Aquinas College growing a market and building a business case for a biodegradable clay pigeon designed by a Capstone Design team this past year; exciting collaboration with some innovative ideas coming from these groups!

Michigan Tech's Capstone Design Program is looking for more industry sponsored projects for the Fall 2010 semester. If you can support this world-class engineering design program, and would like a part of this Capstone Experience, please contact me:

Bob DeJonge
(906) 487-2142
rdejonge@mtu.edu

CAPSTONE
DESIGN PROGRAM

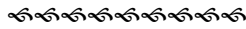
Student Competitions and Team Awards Continued

Senior Design Team 10, had their project, "OpensAll" highlighted in the April 19, 2010 issue of Tech Today. The Team has designed a can opener that can open almost anything. The team consists of ME seniors **William Donavan, Jonathan Hoyer, Tyler LeRoy, Adrian Simula, and Lisa Staehlin**. Their advisor is **Dr. V C Rao Komaravolu** (principal lecturer, ME-EM). Read the article at: <http://www.admin.mtu.edu/urel/today/previous.php?issue=20100419>.



Senior Design Team 16, had their project, "Portable Trap/Skeet Thrower" highlighted in the April 16, 2010 issue of Tech Today. The Team has designed and made a portable thrower. The team consists of ME seniors **Kevin Moran, Sam Hand-schke, Tim Olson, Sam Szpara, and Ryan Ward**. Their advisor is **Dr.**

Chris Passerello (professor, ME-EM). Read the article at: <http://www.admin.mtu.edu/urel/today/previous.php?issue=20100416>.



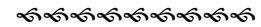
Senior Design Team 33, **Adam Bieber, Andrew Bomstad, Jared Recker, Joshua Schmidt and Benjamin Vindedahl**, had their project "Air Driven Moped" highlighted in the April 15, 2010 edition of Tech Today. Using a couple of scuba tanks and a 1978 Sachs moped, the team built an air driven moped. Their advisors are: **Dr. James De Clerck** (professor of practice, ME-EM) and ME-EM graduate student **Nick Masticola**. Read the article at: <http://www.admin.mtu.edu/urel/today/previous.php?issue=20100415>.



Michigan Tech's **Formula SAE** team placed 63rd overall in the Formula SAE competition held at the Michigan International Speedway on May 12-15, 2010.



The team finished 19th in Design Presentation and tied at 16th for Design overall. They received no penalty points. The faculty advisor is **Dr. William Shapton** (emeritus professor, ME-EM).



Michigan Tech's **Blizzard Baja** team took 16th overall and 1st in Design at the Rochester 2010 Baja competition held at Rochester Institute of Technology, June 10 -13th. The faculty advisor is **Dr. Brett Hamlin** (Assistant Chair, Engineering Fundamentals).

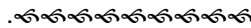


Faculty & Student Invention Disclosures



Drs. William Emblom and Jaime Camilio (adjunct assistant professors, ME-EM) along with Scott Wagner (lecturer, SoT), Kenny Ng (PhD student, Civil Eng) have filed an invention disclosure "A novel high pressure sealing system for tube hydroforming applications that utilizes a tube encompassing flexible gasket and uniquely designed seal activity"

Dr. Gopal Jayaraman (professor, ME-EM) has filed an invention disclosure, "Battery Operated Scoop and Shovel (S&S) Snow Remover".



Dr. Edward Lumsdaine (professor, ME-EM) has filed an invention disclosure, "Thermally controlled packaging and shipping system using optimized temperature gradient".

Senior Design Team 1 has filed an invention disclosure, "Biodegradable Clay Pigeon".



Senior Design Team 2 has filed an invention disclosure, "Gait Aid Device".



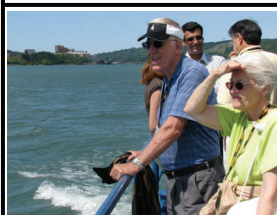
Department Accomplishments

The 2011 graduate program rankings released on April 16, 2010 by US News and World Report: America's Best Graduate Schools rank the Department of Mechanical Engineering - Engineering Mechanics graduate program 48th nationally among doctoral granting mechanical engineering department in the U.S



August 5, 6, & 7

Register for the 2010 Alumni Reunion at: <http://huskylink.mtu.edu/s/349/interior.aspx?sid=349&pgid=991&gid=1&cid=1995&ecid=1995>.



Don't forget to RSVP for the ME-EM Annual Reunion Cruise aboard the Ranger III on Thursday, August 5th. Board the Ranger III at 12:30 p.m. at the National Park Service. RSPV to kagoulet@mtu.edu or phone (906) 487-2551.

Student Accomplishments and Awards

Abraham Morrow and **Duane Morrow** (graduate students, ME-EM) and **John Moyer** (undergraduate student, ME-EM) received \$500 each toward a podium presentation at the American Society of Mechanical Engineers - Summer Bioengineering Conference held in June in Naples, Fla. The faculty advisor is **Dr. Tammy Haut Donahue** (associate professor, ME-EM).

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**Sarah Cavanagh** (jr., ME-EM) received the Rookie of the Year, Outstanding Women in Engineering Award on May 25, 2010, during the 2010 EcoCAR Competition in San Diego, CA. The faculty advisor is **Dr. John Beard** (associate professor, ME-EM).

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Ken Gilkerson (sr., ME-EM) was named to the ESPN The Magazine Academic All-District Team and the All-American Second-Team. This is the second year in a row that he has won all-American honors and was the only student-athlete from the Great lakes Intercollegiate Athletic Conference selected. The Brooklyn Park, MN., native finished 10th in the 800-meter run at the 2010 NCAA Division II Outdoor Track and Field Championships in a school record time of 1:51.08.

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**Alexandru Herescu** (PhD student, ME-EM) was awarded a DeVlieg Foundation fellowship. His faculty advisor is **Dr. Jeffrey Allen**, (associate professor, ME-EM).

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Kasra Momeni (PhD student, ME-EM) received \$500 toward a poster presentation at the 2010 Materials Research Society Spring Meeting Symposium held in April in San Francisco, Calif. His faculty advisor is **Dr. Reza Shahbazian Yassar** (assistant professor, ME-EM).

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**Christopher Morgan** (Ph.D. student, ME-EM) was one of four graduate students from Michigan Tech to go to Lans-

ing to talk with legislators about their graduate studies and future plans. Participating in an observance of Graduate Education Week in Michigan, they joined more than 70 others from universities across the state, meeting with their hometown legislators and displaying posters in the Capitol. Christopher is a member of the Advanced Internal Combustion Engines research group at Michigan Tech, has been using gasoline direct - injection studies to compare ethanol to pump-grade gasoline in a combustion vessel. Now he is working on building a mobile hybrid electric vehicle learning laboratory funded by the US Department of Energy and helping undergraduate senior design students build a hybrid electric vehicle for educational use. His faculty advisor is **Dr. Jeffrey Naber** (associate professor, ME-EM).

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John Moyer (sr., ME-EM) received first place honors at the ASME- Summer Bioengineering Conference in the Bachelor's Level Student Paper Competition held June 16-20, 2010, in Naples, FL. His faculty advisor is **Dr. Tammy Haut Donahue**.

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**Peter Radecki** (sr., ME-EM) was recognized with an honorable mention for the 2010 National Science Foundation Graduate Research Fellowship Program (GRFP) competition. His faculty advisors are **Dr. L. Brad King** (associate professor) and **Dr. Gordon Parker** (professor, both ME-EM).

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The following ME-EM ROTC cadets were recognized in April as outstanding cadets:

Army ROTC:

Reid Barber (so.), Superior Cadet Award and the Dean's List Award

David Brown-Strange (so.), Silver ROTC Medal

Chad Hemingway (sr.), National Sojourners Award and the Athletic Award Series

Kathryn Hill (sr.), Superior Cadet Award

Alexander Tuomi (so.) Dean's List Award

Air Force ROTC:

Timothy Cencer (so.), American Legion Award for General Military Excellence

Trevor Clearwater (jr.), American Legion Award for General Military Excellence

Sean Keys (sr.), American Legion Award for General Military Excellence and Military Order of World Wars Award

Michael LaFevre (so.), American Legion Award for Scholastic Excellence

Jacob LaSarge (jr.), Veterans of Foreign Wars Award

Dylan Penn (jr.), Society of the War of 1812 Award

Nathan Ralph (jr.), Daughters of the Founders and the Patriots of America Award

Sean Ritter (sr.), American Legion Award for Scholastic Excellence and National Defense Transportation Association Award

Keegan Shannon-Lohenry (sr.), American Legion Award for Scholastic Excellence and Air Force Association Award

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**Tolou Shokufar** (PhD student, ME-EM) had her research with nanotubes and orthopedic implants highlighted in the Michigan Tech News. Read the article at: <http://www.mtu.edu/news/stories/2010/may/story26867.html>. Her advisor is **Dr. Craig Friedrich** (professor, MEEM)

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The following ME-EM students were selected for Michigan Tech's Women of Promise:

Jaclyn E. Nesbitt, graduate student
Leslie M. Sabbann, undergraduate student

This award recognizes current female students from each academic department who go above and beyond what is expected of them in terms of being a well-rounded student. The award goes to students who have demonstrated academic achievement, campus and community leadership, good citizenship, creativity and other characteristics of high-achieving individuals.