

Alumni

Letter from the Chair

Greetings from the UP!

As I enter my second year as chair of the MSE department, I do so with a very positive feeling. This past year has been spent working with faculty, staff, and students to identify a clear direction for the department and to define a set of achievable goals on which to focus. This long list of goals includes an effort to communicate more frequently with our alumni through the use of our newsletter. Therefore, for your enjoyment we will publish two editions of the Alumni Alloy each year.

The fall issue will concentrate on our students, their activities, accomplishments, awards and recognitions. The spring issue will focus on faculty, staff and alumni (and more on our students I'd imagine). As you will see in this issue, our students are some of the most active and talented on any campus in the nation.

You may remember in the last Alumni Alloy we were about to embark on a new experience for our undergraduates, namely the Foundry Enterprise. I am happy to report that we are off and running, and I do mean running! I have never seen so many enthusiastic and driven students. This year we have twenty-one students involved in the enterprise, including three students who have not signed up for credit but still want to participate. The students have defined a vision and mission for the enterprise, developed a budget model, and have named the business "Innovative Castings Enterprise" or

ICE. In just our first ten weeks of existence, the students have started working on three major projects and completed a plethora of small tasks. The major projects include the development of a creep resistant magnesium alloy for die casting applications, nondestructive evaluation of aluminum squeeze castings, and design and manufacturing of a beer mug using the lost foam process. In addition, the students have a New Product team working on future ideas to be marketed to students and alumni alike. By the time you receive this newsletter, we should have an active website that will provide more details about ICE and our activities.

The rest of this newsletter highlights our student achievements and I hope you also feel the pride and satisfaction we have in our students. As always, I want to thank all of you who continually support our programs through your generous gifts and pledges. Your support is critical to all of the MSE programs. If you would like specific information about any aspect of our department and our initiatives, please feel free to contact me at mrplich@mtu.edu.

Sincerely,
Mark R. Plichta
Professor and Department Chair



PLICHTA

MichiganTech

Department of Materials Science and Engineering
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931

Alumni updates

In each edition of Alumni Alloy, we will run alumni updates. To be included in this section, please return the Keeping Connected form included in this newsletter.

Louis Weisenberg ('53 MET) works for Weisenberg & Nelson, Inc. as an attorney. He resides in Garden Grove, California.

Auvo Kempainen ('56 MS MET) is retired and looking for a consulting job in aluminum strip/sheet production by continuous casting. He is living in Bonneau, South Carolina. His e-mail is auvokempainen@aol.com.

Richard Beauregard ('64 BS MET) is retired after a thirty-year career with McDermott/Babcock & Wilcox. He resides in Forest, Virginia. His e-mail is rjbeauregard@att.net.

Ronald Gerlock ('65 BS MET) is the director of engineering materials at Designed Alloys, Inc. He resides in Salisbury, North Carolina. His e-mail is rgerlock@designedalloys.com.

Mark Bourgeois ('80 MET) works as a patent agent for CTS Corp. assisting inventors with obtaining patents on their ideas. He resides in Elkhart, Indiana with his wife and three children. His e-mail is markbourgeois@yahoo.com.

Greg Sesselmann ('81 BS MY) is the president of Scentlok Technologies, where he is an inventor and manufacturer of odor elimination clothing technology. He resides in Muskegon, Michigan. His e-mail is greg@scentlok.com.

Tanya Tormala Albee ('87 BS MY) is working as a quality and engineering systems manager at Master Lock Co. She and her two children reside in Brookfield, Wisconsin. Her e-mail is tsalbee@execpc.com.

Evelyn Hoffman Jackson ('90 MY) is a quality design engineer for coated products at Ispat Inland. She resides in Valparaiso, Indiana with her husband and two children. Her

Your support is appreciated!

If you would like to make a donation to the Department of Materials Science and Engineering, please make your check payable to Michigan Tech Fund — Materials Science and Engineering.

Please apply my enclosed donation of \$_____ to the MSE department.

Thanks for your help! Please return this form and your donation to:
Michigan Tech Fund
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931

Alumni Alloy

Bonding alumni with the Department of Materials Science and Engineering at Michigan Technological University

Sponsors provide scholarships and awards for 33 MSE students

Thirty-three students from the Department of Materials Science and Engineering earned scholarships totaling almost \$47,000 during the 2003-04 academic year.

Sponsors of the scholarships include The Minerals, Metals & Materials Society (TMS), American Society for Metals (ASM), Society of Automotive Engineers (SAE), Foundry Educational Foundation (FEF), Alcoa, Ladish Company Foundation, Charles Locke Memorial Scholarship, John Biffel Memorial Scholarship, Ted Rozsa Endowed

Scholarship, Nancy E. Borgeson Scholarship, Katherine M. Bosch Memorial Scholarship, James N. Wessell Scholarship, Professor Gilbert W. Boyd Memorial Scholarship, Elmer W. Cress Memorial Scholarship, and Dr. Corbin T. Eddy Scholarship.

MSE students receiving awards include Ben Almquist, Mark Anderson, Sarah Bennett, Erin Burns, Margaret Bush, Kerry Chinnock, Tim Ciarkowski, Jenny Collins, Brent Fogal, Anna Marie Gehrcke, Bryant Gerbers, Jacob Gorkowski, Andrea

Hansen, John Hughson, Allen Hunter, Kevin Jacobe, Dierdre Johns, Erin Johnson, Anne Jugger-nauth, Ngan Fai Leung, Joe Licavoli, Alicia Mikel, Eric Morgan, Dan Nordyke, Erica Orth, Oluwa Funmilo Oyebola, Stephanie Oehlke, Patrick Quimby, Andrea Schmidt, Victoria Sternhagen, Danielle Visser, Jana Young, and Angela Zsidi.

Visser and Sternhagen were honored with two prestigious awards from TMS and ASM, and MSE student Erin Burns won a major award from SAE.

Keeping Connected

We in the Department of Materials Science and Engineering are very proud of our alumni, many of whom have accomplished a great deal in their professional and personal lives. We value the continuing relationships that exist between the faculty, current students, and alumni. Please use the form below to update us on the recent developments in your life. We will include your responses in future newsletters, if you request.

Name (if applicable, please include your maiden name) _____

Graduation year and degree _____

Address _____ City/State/Zip _____

Telephone _____ E-mail address _____

Current job title and employer _____

Any other information _____

May we include this information in a future newsletter? (circle one) yes no

Please return this form to:
Department of Materials Science and Engineering
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931

Or fax a copy to (906) 487-2934, or e-mail this information to Mark Plichta at mrplich@mtu.edu.

Student gets top award from automotive society

Undergraduate Erin Burns was one of six recipients of the 2003 SAE Long Term Member Sponsored Scholarship. The \$1,000 scholarship is awarded on the basis of the student's support of SAE's activities, collegiate chapter, and SAE's local section and its programs.

As president of the Michigan Tech SAE student chapter during the 2002-03 academic year, Burns organized several outstanding technical meetings, including meetings on the PRO, and for Chrysler, General Motors Corp., and Ford Motor Co.

She was also responsible for coordinating the SAE project activities such as Formula Car, Baja, Clean Snowmobile Challenge, Future Truck, and SAE's Aero Design competitions.

Last year, she coordinated the Michigan Tech booth at the SAE International Congress and Exhibition in Detroit. The booth took first place in the student competition.



BURNS



Every fall, the MSE department's faculty, staff, students, and families enjoy a potluck lunch. Pictured in front are Electron Optics Engineer Owen Mills and undergraduate Dale Anderson.

Students

Student organizations busy planning projects and making industry connections

Alpha Sigma Mu

Alpha Sigma Mu is the metallurgical and materials engineering honor society established to recognize outstanding students who possess a high degree of exemplary integrity, leadership, and initiative.

Mark Anderson, student chapter president, said the ASM student chapter coordinates the department's t-shirt design; helps Little Brothers Friends of the Elderly with their annual holiday food drive; visits local and hometown high schools to increase interest in engineering, and promotes the Materials Science and Engineering Department at Michigan Tech.

Alpha Sigma Mu also coordinates the annual MSE banquet held each spring.

All alumni of the MSE department are welcome to attend.

In November, the ASM/TMS, ISS, and AFS student chapters attended the 2003 Materials Science & Technology conference in Chicago.

Iron and Steel Society

The ISS student chapter at Michigan Tech helps students build a broad-based understanding of the iron and steel industry and a sense of unity with their peers.

Andrew Iannettoni, student chapter president, said the twelve-member organization is dedicated to making students aware of scholarships, job opportunities and professional meetings related to this industry.

"Students interested in a career in the iron and steel industry are urged to join," Iannettoni said.

For more information, go to <http://www.iss.org>.

American Society for Metals/The Minerals, Metals & Materials Society

The ASM/TMS student chapter at Michigan Tech encompasses the entire range of materials and engineering, from minerals processing and primary metals production to basic research, and the application of advanced materials.

Benjamin Almquist, student chapter president, said the organization is establishing a learning center for the introduction to materials science classes and is seeking industrial speakers for the year.

For more information, go to <http://www.tms.org>.

American Foundry Society

The AFS student chapter's mission is to provide and promote knowledge and services that strengthen the metal casting industry for the ultimate benefit of its customers and society.

Danielle Visser, student chapter president, said the organization has plans to bring in presenters from GM-SMCO, Applied Process Inc., and Alcoa. They are coordinating a meeting with the Northeast Wisconsin chapter of AFS and planning foundry tours.

The AFS chapter wants to team up with other MSE student chapters, and provide a program to educate future college students about the endless possibilities in the MSE/metal casting field.

For more information, go to <http://www.afsinc.org>.

Undergrad gets ASM foundation scholarship

Undergraduate Victoria Sternhagen has won one of the annual George A. Roberts Scholarships, which provides \$6,000 towards educational expenses for one academic year.

The scholarship was established in 1995 by ASM Past President Dr. George A. Roberts to help further the education of students serving as role models in the field.

Sternhagen, who is studying abroad in Sweden this year, also earned the ASM International Materials Education Foundation Scholarship for the 2003-04 academic year.

The scholarship goes to outstanding undergraduate stu-

dents at the junior or senior level who demonstrate exemplary academic and personal achievements, interest and potential in metallurgy or materials science and engineering, as well as financial need.

All North American undergraduate college students majoring in materials engineering or a related discipline are eligible for these scholarships. Competition is strong and winning is an outstanding accomplishment.



STERNHAGEN

Student gets 2nd major TMS award

Picks up free books for Michigan Tech's library

Undergraduate Danielle Visser was awarded one of three TMS Light Metals Division scholarships for the second straight year.

These \$4,000 cash scholarships are awarded each year to undergraduate students majoring in metallurgical engineering or materials science with an emphasis on both traditional and emerging light metals.

In addition to this cash award, Visser will be given the opportunity of selecting up to \$300 in LMD-sponsored conference proceedings or textbooks to be donated to the Michigan Tech J.R. Van Pelt Library in her name, and up to \$400 in books for the award recipient.

She will receive the award during the LMD Luncheon March 17, 2004 in Charlotte, North Carolina.

"A student rarely wins more than one of these scholarships, making Visser's 'repeat' all the more impressive," said Mark Plichta,

MSE Department chair.

Visser also earned the Edward J. Dulis Scholarship, which provides \$1,500 towards educational expenses for one academic year.

Dulis' family established the scholarship this year to honor his interest in education, and his involvement in and commitment to ASM International.



VISSER

Summer Youth Program encourages engineering

Every summer, Michigan Tech sponsors a Summer Youth Program for high school students. Pictured at left, Julia Spalding of Saginaw, Michigan and Gerrica Shorter of Lansing, Michigan finish a sand mold for MSE session, "From a 3-D Printer to a Cast Metal Object." Pictured below, Troy Villanueva of Lansing, Michigan and Ben Thomas of Sterling Heights, Michigan cast an aluminum alloy, also during the 3-D printer project.



Seniors top off final year with industrial challenges

Groups tackle design projects

The MSE Senior Design projects are a crucial part of the MSE curriculum. A corporate sponsor and industrial advisor propose a real-life challenge for the students to work on. A faculty advisor leads the student teams.

Problems are open-ended, and are very similar to problems that graduates will be solving in industry. Communication and teamwork skills are emphasized.

The department designed the concept in the early 1990s, with students tackling such topics as creating new materials for the U.S. Olympics luge team, discovering high temperature materials for vapor coatings for 3M, designing polymeric motorcycle components for Harley-Davidson, finding uses for Al-foams for Norsk Hydro, and designing a torque sensor for General Motors Corp.

Several projects have resulted in patent applications.

In addition, the projects have earned the students a handful of awards.

A project on intermetallic growth in lead-free solders sponsored by IBM Corp. won the 2003 TMS student design competition. A presentation on pickling steel bars in 1996 earned the Steel Bar Award at the annual Iron and Steel Society meeting. And two years ago, MSE students took second and third place in Michigan Tech's annual poster competition.

Students, advisors report on 2002-03 senior design

The projects, corporate sponsors, industrial advisors, academic advisors, and student participants for the 2002-03 Senior Design projects were:

Characteristics of Extrusion Charge Welds

The object of this project was to determine the length of the charge weld region in extruded structural components, and evaluate the mechanical behavior of the extrusion in the weld region. Tensile samples were cut 45 degrees and 90 degrees to the extrusion direction.

The group observed charge weld separations, which decrease more rapidly in the center of the profile due to different flow rates, and degraded mechanical properties in the weld.

The mechanical properties of the 45-degree samples were superior to the 90-degree samples, due to the difference in grain orientations.

The corporate sponsor was Hydro Automotive of Holland, Michigan; the industrial advisors were Helen Weykamp and Ben Bernard; the academic advisor was MSE Professor Calvin White; and the student participants were Kristi Bock, Brett Krause, Eliot Niemi, Tyler Nooyen, and Stephanie Savage.

Analysis of Surface Properties of Biomaterials

Students found that biocompatibility of Ti-6Al-4V and 316L stainless steel implant materials can be manipulated by surface nanoroughness and characteristics, and acid-base properties.

The results have provided strong evidence that the density and distribution of hydroxide groups on the oxide surfaces is important in design implant materials with enhanced biointeraction to bone cells.

The corporate sponsor was Medtronic, Inc. of Minneapolis, Minnesota; the industrial advisor was Niam Istephanous; the academic

advisor was MSE Associate Professor Jarek Drelich; and the student participants were Laura Bren, Laurel English, Joshua Fogarty, Rebekah Policoro, and Angela Zsidi.

Texture Development in Titanium Alloy Sheet

The purpose of this project was to determine the relationship between texture, microstructure, and mechanical properties of hot rolled Ti-6Al-4V sheets. Students performed X-ray diffraction to determine the lattice parameters of the phases present, the volume fraction of primary alpha, and the crystallographic orientations of phases.

Students found the magnitude of yield strength difference is due to variations in grain size and orientation of the basal plane.

The corporate sponsor was Timet of Denver, Colorado; the industrial advisor was J. Keith Williamson; the academic advisor was MSE Professor Karl Rundman and the student participants were Zach Strauss, Nick Nanninga, Greg Jarski, Delenea Dunford, and Liza Lauw.

Dendrite Formation and Orientation in Sn-Based Solders

This group addressed thermal fatigue properties of solder balls by evaluating the number of dendrites in solder balls and their dependence on cooling rate.

Results showed concentrations of three to seven dendrites per solder ball, and the number of dendrites did not appear to be a function of these cooling rates.

The corporate sponsor was IBM, Corp; the industrial advisor was Donald Henderson; the faculty advisor was MSE Associate Professor Doug Swenson; and the student participants were Dan Emelander, Jason Jeannette, Aaron LaLonde, Carolyn Larson, and Ward Rietz.