



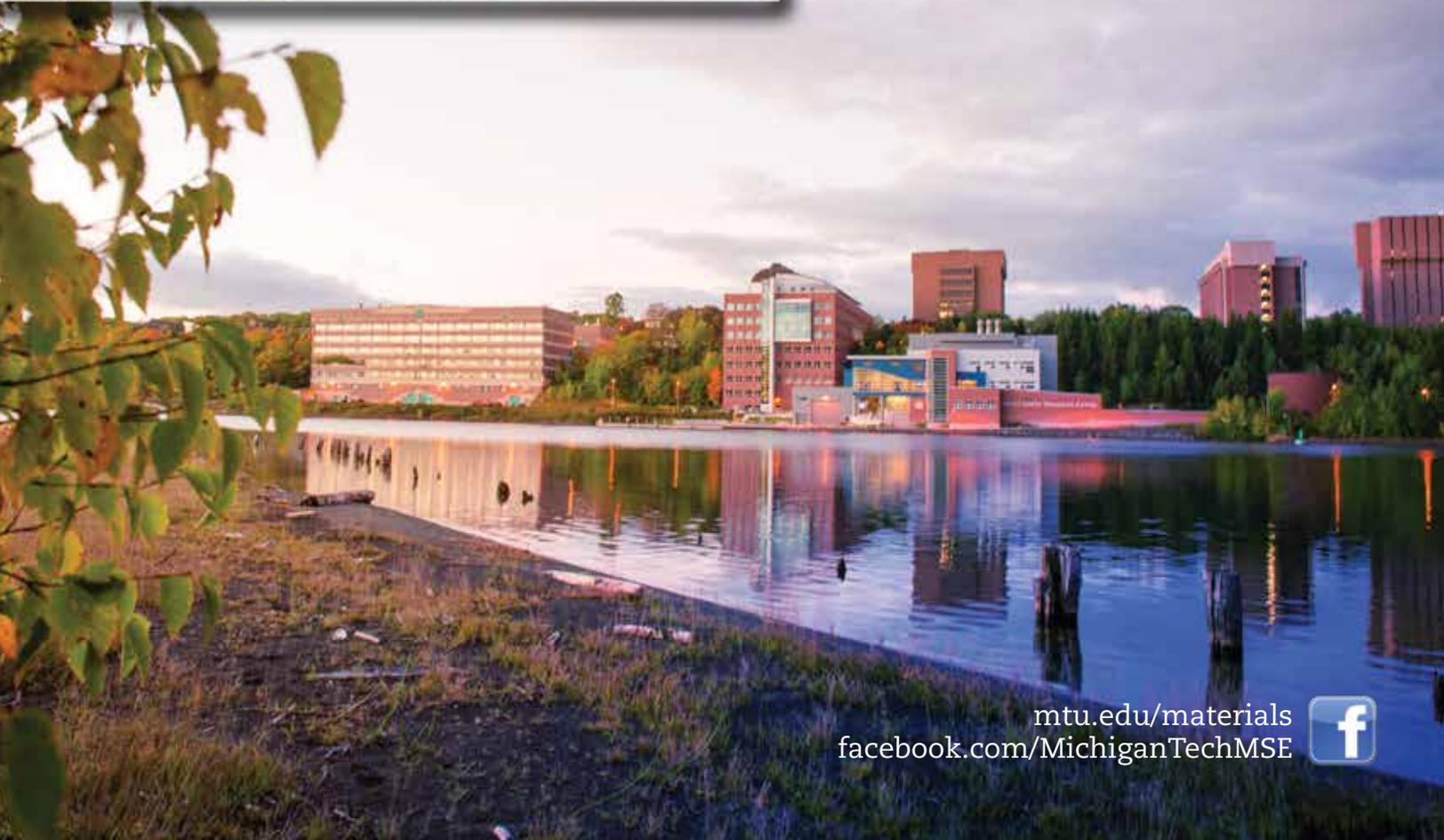
**Michigan Tech**

# MSE Annual Report

Materials Science and Engineering • Michigan Technological University



Fall 2015



[mtu.edu/materials](http://mtu.edu/materials)  
[facebook.com/MichiganTechMSE](https://www.facebook.com/MichiganTechMSE)





## Greetings from the Copper Country, Michigan Tech, and the MSE Department!

It is my pleasure to again share with you a summary of the past year's highlights in MSE. It's been another good year, and I continue to be proud of the accomplishments of our students, faculty, staff, and alumni.

Over the last two years, I have reported on significant increases in our undergraduate enrollment. This year, that trend has continued; our 2014-15 undergraduate enrollment has risen to approximately 130 students, the highest since the 1994-95 academic year. Our graduate enrollment has also increased to approximately 42 students, the highest since 1993-94. The undergraduate enrollment increases align with national trends in the MSE discipline, arguably attributable to improved awareness of the role of materials in technology and manufacturing and career opportunities that exist in the field. The increase in graduate enrollment is partially attributable to MSE's recent decision to participate in a course-only Master of Science program, in response to heavy national demand for a post-baccalaureate professional degree. Over the last two years, we have accepted approximately 15 students into this non-thesis program; several of these students have since

transitioned into a thesis-based Master of Science degree plan of study. It is our intent to utilize the course-only program in a way that benefits the research program by providing a pool of candidates for emerging research assistantships, and by enriching and enlarging the graduate community as a whole within MSE.

The 2014-15 academic year has brought some exciting news with regards to our facilities. We were pleased to learn that Michigan Tech was the recipient of a National Science Foundation Major Research Instrumentation (NSF MRI) award, for the purpose of acquiring a state-of-the-art, aberration-corrected, scanning transmission electron microscope (STEM). The proposal was coauthored by a multidisciplinary university team, which included MSE Professor Stephen Hackney (profiled in this report). An FEI Titan Themis microscope has been ordered, with delivery expected in late December of 2015. More information will be provided in our next annual report as the microscope becomes operational and these new capabilities emerge.

I am also pleased to report that the department has received, installed, and reconditioned a 550 ton extrusion press, a gift from Alcoa Inc. This has been installed in the materials processing laboratory on the first floor of the M&M building. This academia-unique capability will add to our existing deformation processing capabilities and complement MSE's already impressive suite of processing tools—which include the metal casting facility, the particulate processing lab, the emerging 3D printing capabilities, and the



electronic fabrication laboratories that are co-managed with the Electrical and Computer Engineering (ECE) Department.

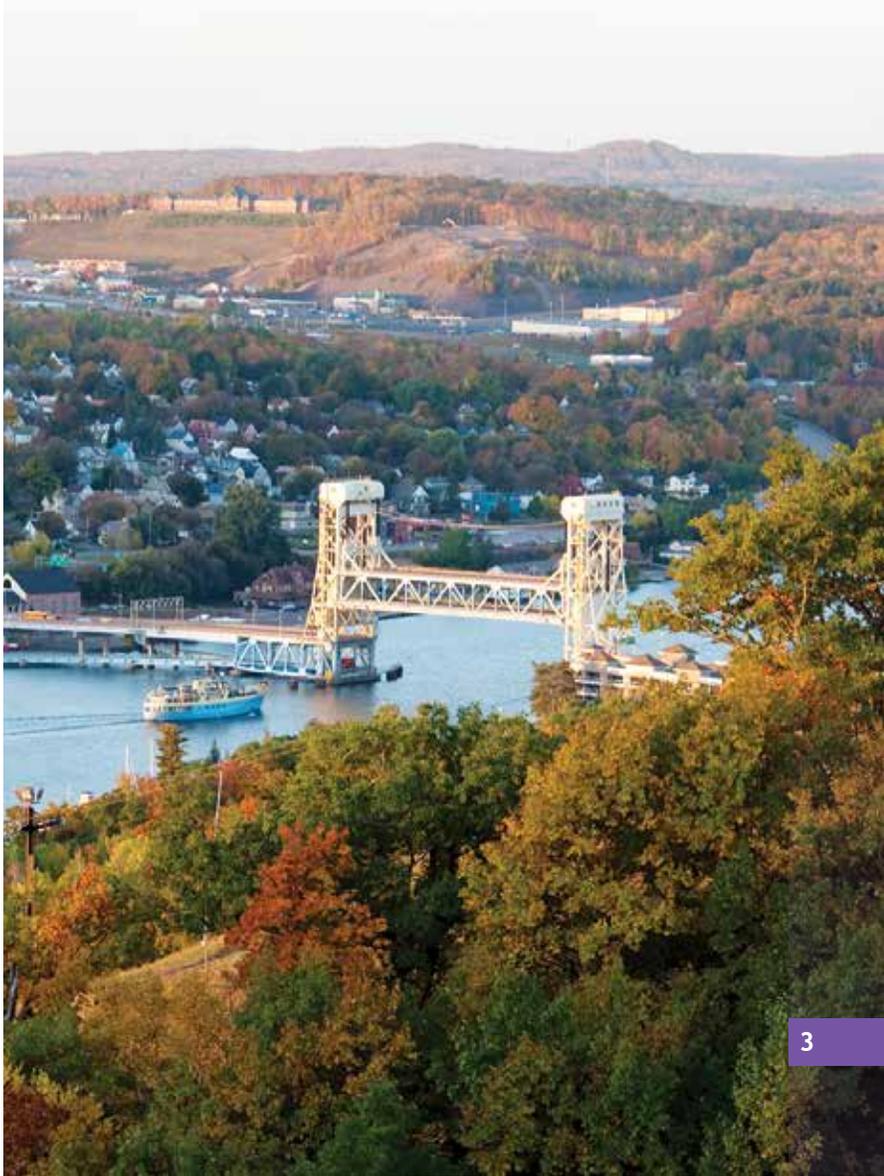
Finally, we are pleased to welcome Assistant Professor Erik Herbert and his family to Houghton, Michigan Tech, and MSE. Erik has joined us following a previous joint appointment with the University of Tennessee at Knoxville and Oak Ridge National Labs. He brings expertise in property measurements at small length scales, with notable expertise in the emerging area of nano-indentation techniques and analyses. Fortuitously, these capabilities will benefit from being housed in the new vibration-dampened annex building being constructed for the new STEM mentioned above. Erik and his family happen to be avid mountain bikers, which bodes well for a long and successful academic career at Michigan Tech.

As always, I continue to appreciate all of the support we receive from alumni and friends of the department. Your partnerships are very important to us, and have become a critical means by which we pursue our goals to ensure a top quality educational experience for our students.

Until next time and with sincere regards,



Stephen Kampe



## Table of contents

- 4 Faculty and Staff News
- 6 Faculty Research
- 8 Student News
- 10 Senior Design Teams
- 12 Outreach
- 14 Alumni News
- 15 MSE by the Numbers
- 16 Endowed Professorships

## New Faculty



### Erik Herbert Assistant Professor

Assistant Professor Erik Herbert joined the MSE faculty in June 2015. Herbert comes to Michigan Tech from the University of Tennessee where he was an assistant research professor. He completed his MS

and PhD degrees in MSE at the University of Tennessee in 2006 and 2008, respectively. Prior to his research appointment at UT, Herbert spent 11 years at Nano Instruments, Inc. in Oak Ridge, TN.

Herbert's research focuses on the development and implementation of state-of-the-art small-scale mechanical characterization techniques that enable ambient, non-ambient, inoperando, and in-situ mechanical testing of materials at nanometer and micrometer length scales.

Herbert will teach the department's introductory course, MY2100 Introduction to Materials Science and Engineering, in spring 2016, which he also taught at the University of Tennessee.

"My move from a research position to a tenure-track faculty position in MSE at Michigan Tech was a great opportunity," says Herbert. "The department is well established and possesses the infrastructure and expertise to complement and enhance my research efforts, while also enabling me to maintain a strong focus on both undergraduate and graduate teaching."

Herbert and his wife Marta have four children and two cats. He enjoys mountain biking and—as time permits—the entire family enjoys spending time on the water and exploring their new surroundings. "I suspect we will take up skiing this winter, since Michigan Tech operates its own ski hill," Herbert adds.

## Faculty and Staff Briefs



Professor **Yun Hang Hu** was elected a Fellow of the American Association for the Advancement of Science (AAAS), the world's largest general scientific society and publisher of the journal *Science*. Hu was honored for his distinguished contributions to the field of

novel materials and catalysts, particularly for molecular design and synthesis of nanomaterials for energy conversion, storage, and utilization.



Congratulations to **Edward Laitila** who was promoted to senior research engineer/scientist and adjunct assistant professor in June 2015.



Congratulations to **Peter Moran** who was promoted to professor with tenure in August 2015.



Professor **Larry Sutter** was reappointed as a Faculty Fellow for 2015–16. The Faculty Fellow Program is sponsored by the Office of the Vice President for Research. Sutter is charged with facilitating discussion on chemical purchasing/storage and hazardous material

disposal, as well as reviewing issues related to the uniform guidance policy and its impact on procurement and property management.



Associate Professor **Paul Sanders** will be spending the 2015–16 academic year on sabbatical at Deakin University in Australia.



Professor **Miguel Levy** will be spending the 2015–16 academic year on sabbatical at the Air Force Materials Labs in Dayton, OH.

## Staff News

### ¡Ciencia y Ingeniería de los Materiales en España! (Science and Engineering of Materials in Spain!)



Dan and Michelle Seguin shown at Santa Barbara Castle in Alicante, Spain.

Dan Seguin, MSE academic advisor and research engineer, spent 6.5 weeks in Alicante, Spain, as part of a grant from the University Study Abroad Consortium (USAC), which Michigan Tech administers. As an academic advisor, Dan is often tasked with advising students on study-abroad opportunities—and his time working alongside students in Alicante, as well as surrounding cities Madrid, Barcelona, Valencia, and

Tabarca Island gave him a better appreciation for what students experience while studying abroad. This experience will help him to more effectively advise MSE students who are interested in pursuing a study-abroad opportunity.

In addition, Seguin worked with program directors to develop future potential collaborations between Tech and the USAC for students, faculty, and staff. “There may be significant value in our department offering an introductory MSE course, such as MY2100, at a study-abroad site,” he says. “Such an offering could be beneficial to our students, as well as other American engineering students studying abroad.”

Seguin also took three courses at the University of Alicante—a Madrid field study, sailing, and elementary Spanish I. “I arrived in Spain knowing ZERO useful Spanish,” he says. “Being immersed in the rich culture was a learning experience and my conversational Spanish improved significantly in a relatively short period of time.”

His wife, Michelle, a family physician with UP Health Systems Portage, joined him for the last two weeks of his stay. “Michelle and I agree that the Spaniards are among the kindest and most welcoming people we have met,” he says. “We developed a deep appreciation for the history and culture of Spain. And the food—absolutely excellent! Spanish cuisine is very simple but very good, with fresh seafood and produce available every day!”

### Pat Quimby Takes Sabbatical at Carley Foundry



Last summer, Pat Quimby, MSE foundry coordinator, was offered an opportunity he couldn't pass up. “Dr. Kampe approached me about taking a staff sabbatical at Carley Foundry in Minneapolis, MN,” he says. “I eagerly accepted this chance to enhance my knowledge of an industrial foundry in operation and to better understand what industry

is looking for in our graduates.” The focus of Quimby's six-month stay was to identify root causes and solutions to casting defects, work on improving procedures for sand testing and metallurgical analysis, and share his metallurgical expertise with other engineers and production staff. Quimby says he was very fortunate to work with an exceptional team of people. “I learned many of the benefits and challenges that come with working in industry and I made many industrial contacts,” he says. “I'm confident I can mentor our students about what they can expect in the industrial world.” Although he didn't miss the large amount of snow he usually plows at his Painesdale



home, he said he could live without the -50 degree wind chills! “And it was great to have home improvement stores closer than 100 miles away!”

# BREAKING NEW GROUND

P

rofessor Stephen Hackney's career path has taken a challenging direction over the past year. Department Chair Steve Kampe presented Hackney with a new opportunity to lead the department's graduate program. In this role, he was tasked with initiating a new non-thesis MS program. The non-thesis MS program expands the educational opportunities for qualified, self-supported students, while at the same time provides an enthusiastic pool of graduate students who can begin research programs as they become available. "This first year has been a learning experience as I have dealt with over 300 applicants from all over the world, while trying to navigate administrative procedures," Hackney says. "It is clear there are many more qualified applicants than there is available research funding."

Over the years, Hackney's research has explored many areas of materials science: phase transformations in metals, diffusional stability, battery electrode materials, and most recently, processing of magnetic materials. "These varied research directions have helped me understand how expertise in an analysis tool or a mathematical technique developed for an old

problem can be utilized to move forward in solving a new problem," he says. "Application of transmission electron microscopy (TEM) is one of those tools that helped my research transition from metallic materials to battery electrode materials, just at the time when structure-electrode property relationships were beginning to be explored. Our interactions with Michael Thackeray and Christopher Johnson at Argonne National Lab and Bill Bowden at Duracell were incredibly productive. Of course, now there are many investigators working in high resolution characterization of battery materials, and these contributions from around the globe are allowing rapid progress in developing new electrode materials."

"Steve Hackney is one of Tech's best scientists, and has contributed much to our discipline," Kampe says. "He brings experience and leadership to our graduate program; this has been excellent and much appreciated."

Prior to joining Michigan Tech, Hackney was a graduate student of MSE alumnus Gary Shiflet at the University of Virginia. Upon completing his dissertation, he served as a Research Assistant at the National Institute of Standards and



*Stephen Hackney was challenged to create a new kind of graduate degree—while maintaining his research excellence.*

Technology (NIST), where he worked with National Medal of Science recipient John Cahn, an acknowledged leader in mathematics, thermodynamics and kinetics, and phase transformation of materials.

Hackney was co-PI on a recently funded \$1.2M NSF program to obtain a state-of-the-art scanning transmission electron microscope (STEM) at Michigan Tech. “This research has been pioneered by Reza Shahbazian-Yassar of ME-EM, and will give us the resources to take advantage of new high resolution techniques to study materials under liquid environments, such as electrodes and biological cells,” says Hackney. “However, this new opportunity has presented a problem—this atomic resolution instrument requires very low background vibration, low electromagnetic field interference, and strict environmental control—the current M&M building was not built to handle this type of instrument. As of this writing, we are in the planning stages of building an addition onto the current building which can meet the requirements of the new STEM, and also solve our other laboratory environment issues, which have plagued use of high-resolution SEM, AFM, and nano-indentation for many years.”

Hackney has now been at Michigan Tech for 30 years. “The students at Tech—and in MSE in particular—project a positive attitude towards learning, and this has provided tremendous job satisfaction,” he says. “I am not sure there would be a better place for me than Tech and the Keweenaw. I feel lucky that I was able to raise a family here, while enjoying a great working environment, coupled with unparalleled opportunities in mountain biking and cross country skiing, two of my passions.”





## Summer Undergraduate Research Experience

MSE senior **Sara L. Schellbach** received a Summer Undergraduate Research Experience (SURE) scholarship from Wayne State University, School of Medicine, for the summer 2015. Sara worked in the Hydrocephalus Laboratory at Children's Hospital of Michigan under the direction of Carolyn Harris. Her research focused on imaging cerebral shunt explants to help prove and further support the hypothesis that shunt failure in infants is often the consequence of glial cells (astrocytes and microglia) blocking the holes of the ventricular catheter, thus stopping the flow of cerebral spinal fluid (CSF) and allowing the initial condition of CSF build up in the brain. In addition, Sara also conducted research to improve a physical model which serves to imitate fluid flow within the ventricles of the brain. "As a bonus, I was able to observe an actual brain surgery in which a failed shunt was replaced with a new shunt," she says. "The experience was truly magnificent!"



## Winter Carnival Royalty

MSE students **Laura Jewett** and **Rachel McCollough-Smith** participated in the 2015 Winter Carnival Queen competition. Laura took the crown and Rachel was first runner-up. Congratulations to both of them!

## ASM Detroit Chapter Award

**Janine Erickson** was awarded the 2015 Marion Semchyshen Scholarship from the ASM Detroit Chapter for "high scholarship, active extracurricular activities, and deep interest in the field of materials science."

## Departmental Scholar Named

**Brian Brook** was named the MSE Departmental Scholar for his academic accomplishments, participation in undergraduate research, and his leadership talents as a student leader on the power team of the Aerospace Enterprise.

## RISE Scholarship

**Jacob Braykovich** won a Research Internship in Science and Engineering (RISE) scholarship, provided by the German Academic Exchange Service, in summer 2014. These scholarships are highly competitive and recipients are chosen on the basis of outstanding academics and convincing project proposals and/or statements of purpose.

## Presidents Award for Leadership

**Kimberly D'Augustino** received Michigan Tech's most prestigious undergraduate award, the Presidents Award for Leadership. President Glenn Mroz cited D'Augustino's numerous accomplishments, including serving as vice president of the biomedical engineering society, mentoring students through the Wahtera Center for Student Success and the ExSEL program, and acting as event coordinator for the campus Relay for Life.



## Academic Achievement, Shorraw Awards

**Calvin Nitz** was presented the 2015 Alpha Sigma Mu Academic Achievement award for the highest GPA among graduating seniors at the spring senior banquet. **Jacob Braykovich** was presented the Richard Shorraw Memorial Award, given to the graduating senior showing greatest improvement in grade point average over the course of their studies at Tech.

**Alumni Alert!** Due to misplaced records, we do not have a complete archive of Academic Achievement and Shorraw Memorial Award recipient names from 1997–2008. If you can help by providing a name of a recipient, please contact [kampe@mtu.edu](mailto:kampe@mtu.edu).

# Materials United



Hi, I'm George Castle, the incumbent president of Materials United (MU), a student organization designed to expose students to all aspects of materials science and engineering. Through MU, students have opportunities to meet with fellow students, learn about industry, and are introduced to the major materials

societies: AFS, ACerS, ASM, TMS, and AIST.

Last year, Materials United attended the Materials Science and Technology Conference (MS&T) in Pittsburgh. We attended receptions, lectures, and enjoyed the sights and activities in the Steel City. MU also participated in AFS-sponsored casting competitions, held various social events for the students, and organized the Engineering Explorations open house to introduce first year engineering majors to the materials science discipline. We also created a

new event—Castathon!—that challenges student teams to design, create a pattern, and cast an object of their own choice, all within a 24-hour marathon-like timeframe. During career fair, we organized a Meet-and-Greet reception for attending company representatives to provide them with a chance to meet our students outside of the formal career fair setting. We also organized career preparation sessions, hosted jointly with Gerda.

In the upcoming year, we plan to expand our activities to include an initiative to make MU more accessible to students, alumni, and those in industry by way of an easy-to-navigate student-run website. The site will feature articles describing current projects, an events calendar, and even a scholarship database. MU always welcomes support from alumni and industry; to get involved please feel free to contact me, George Castle, at [gycastle@mtu.edu](mailto:gycastle@mtu.edu), or go to our web link at: [www.mtu.edu/mu-giving](http://www.mtu.edu/mu-giving). Thank you from all of us in Materials United for your continued support as we grow and improve our organization!

# Advanced Metalworks Enterprise



Greetings! My name is Tyler Brose, president of the Advanced Metalworks Enterprise (AME). During the 2014–15 school year, AME continued to grow as an enterprise and a business. The enterprise continues to maintain strong enrollment: between 40–50. With this large group of students, AME undertook

eleven different projects sponsored by ArcelorMittal, AIST, AK Steel, AmericaMakes, Eck Industries, Gerda, Linamar, Magline, and Waupaca Foundry. These projects included MIG-weld 3D printing of aluminum and steel alloys, determining alternatives to beryllium in 357 aluminum alloys, optimizing the skeleton design for

Magline's Coolift®, and analyzing the weldability of high silicon ductile iron alloys.

AME provides students with unique opportunities that would be difficult to experience elsewhere. One example is the use of Michigan Tech's foundry and its large collection of testing equipment as a way to partner with industrial sponsors. For example, our Gerda-sponsored project involved ways to recover iron from scrap materials. The team was able to access Michigan Tech's foundry to run a series of focused experiments that could not be easily accomplished using the company's full-scale production facility without major disruptions to daily business. Opportunities such as this provide AME students the experience of interacting with companies in a way that is meaningful to all involved. We believe such experiences will be a valuable asset in our education.



## American Foundry Society NEWS

Eleven students won scholarships from the Northeast Wisconsin (NEW) Chapter of the American Foundry Society. Shown at left are eight of the eleven students, who traveled to Neenah, WI, in March, for the dinner and award presentation. Michael Oyervides presented his undergraduate research on the design of high temperature ADI. Melissa Galant won the Roloff Scholarship, the most prestigious award of the evening.

Left to right: MSE Associate Professor Paul Sanders, Justin Nichols, Mu Yuan, Austin DePottey, Jordan Pontoni, Michael Oyervides, Brittany Hoffman, Melissa Galant, and Zachary Boyden. Missing from photo: Joshua Dorn, Georgia Hurchalla, and Rachel McCollough.

# Senior Design Teams/Sponsors



## Corrosion Rate Characterization of Tin-Plated Aluminum Bus Bars

Team: Jacob Gerdt, Allie Glover, Annie LeSage, Kyle Myszka  
 Faculty Advisor: Stephen Kampe  
 Sponsor: Yazaki Liaison: Ajay Singh



## Production Measurement of Cast Steel Toughness

Team: Robert Cooley, Nathaniel Musser, Andrea Paul, Bill Price  
 Staff Advisor: Paul Fraley  
 Sponsor: MEGlobal Liaison: Ed Vesely



GE  
Aviation

## Composition Effects on Cobalt Tungsten Carbide Cutting Tool Performance

Team: Jake Demarais, Garrett Dubie, Rob Lippus, Justin Nichols  
 Staff Advisor: Dan Seguin (AME)  
 Sponsor: GE Aviation Liaison: Howard Weaver



**Eck Industries, Inc.**  
 Specialists in premium aluminum castings

## Maintain Ductility in 357 Aluminum without Beryllium

Team: Shane Anderson, Austin DePottey, Calvin Nitz, Jordan Pontoni  
 Staff Advisor: Tom Wood (AME)  
 Sponsor: Eck Industries Liaison: David Weiss



FIAT CHRYSLER AUTOMOBILES

## Stamping FEA Optimization using Local Material Properties

Team: Kara Bakowski, Jacob Braykovich, Alex Kampf, Zachary Morgan  
 Faculty Advisor: Stephen Hackney  
 Sponsor: Fiat Chrysler Automobiles Liaisons: Cory Karosa, Mike Warhus



## Composite Longboard Design and Fabrication

Team: Stephanie Haselhuhn, Austin O'Connor, Stephen Olson  
 Faculty Advisor: Ibrahim Miskioglu  
 Sponsor: BoardSport Technologies Enterprise



## Aluminum 3D Printing Process and Alloy Development

Team: Zach Boyden, Mike Buhr, Martin Schaub, Marvin Yuan  
 Staff Advisor: Tom Wood (AME)  
 Sponsor: AmericaMakes Liaison: Paul Sanders



## Effect of Grain Boundary Misorientation on Mechanical Properties of Nickel Alloys

Team: Laura Jewett, Jenna Procter, Alex Reinl, Emily Veltman  
 Faculty Advisor: Walter Milligan  
 Sponsor: Alcoa Howmet Liaison: Aaron Lueker



## Effect of Deformation on Pipe Steel Properties

Team: Melissa Galant, Natalie Pohlman, Bradley Villeneuve,  
 Mitchell Wieferich-Cramer  
 Staff Advisor: Russ Stein (AME)  
 Sponsor: ArcelorMittal Liaison: Evelyn Jackson

# Michigan Tech MSE Senior Design Accolades!



The Design Expo's "Best Image", submitted by the Eck Industries-sponsored team.



Eck Industries team members Austin DePottey (left) and Shane Anderson (right) accept the ASM Materials Design Competition Award from David B. Spencer (center), Chair of the ASM Materials Education Foundation at the ASM Awards banquet as part of the Materials Science and Technology (MS&T) October 2015 conference in Columbus, OH.

Congratulations to the **MSE Yazaki Senior Design Team**—Jacob Gerbt, Alexandra Glover, Annie LeSage, and Kyle Myszka—who took first place in the overall competition at the 2015 Michigan Tech Design Expo.

The **Eck Industries-sponsored team**—Shane Anderson, Austin DePottey, Calvin Nitz, and Jordan Pontoni—was the recipient of the MSE External Advisory Board's Outstanding Project Award, presented by the EAB at the spring senior banquet. Earlier in the day, the team received the First Place Award in the Best Image competition for the entry above left.

The **Eck-sponsored project** was also the recipient of the 3rd Place award in the national ASM Undergraduate Design Competition, awarded at the MS&T conference in October 2015; above right. The 2015 prize represents the fourth consecutive year that Michigan Tech has appeared on the awards stage, taking 2nd place prize each of three previous three years.

The **Fiat-Chrysler sponsored senior project**—comprised of team members Kara Bakowski, Jacob Braykovich, Alex Kampf, and Zachary Morgan—was given the Student's Choice award at the MSE spring senior banquet.



**FEF  
Scholarship  
Winners**

Pictured at right are recipients of scholarships from the Foundry Educational Foundation (FEF). The FEF provided \$11,750 in scholarship funding for students during the 2014–15 academic year.



Left to right: Michael Oyervides, Tyler Brose, Allison McLeod (MET), Zachary Boyden, Nicole Treinen, Austin DePottey, Tessa Burgess, Joshua Krugh, Laura Gazza, Justin Nichols (MET), Melissa Galant, Evan Olson, Henry Brewer (MET), Mu Yuan.

## Outreach



### ASM Materials Camp for Teachers

Using materials science as a theme, ASM Teachers Camps are idea-generating workshops that show K–12 educators new ways to use recognizable, everyday materials and products to assist in teaching math and core science principles. MSE hosts a class each year; shown above are the participants of our course conducted in June 2015.



### MSE and SYP

MSE continues to actively take part in Michigan Tech's Summer Youth Programs (SYP), participating in Women in Engineering, Engineering Scholars, and Explorations in Engineering programs. SYP participants are involved in projects such as casting, blacksmithing, and designing patterns with 3-D printers.



### Finlandia University Textile Class Visits Foundry

Science and art can beautifully coexist. Each complements the other—you just have to explore the connections. And that exploration is just what happened during a collaboration between a sculpture class from Finlandia University's International School of Art and Design and Michigan Tech's Department of Materials Science and Engineering last spring.

The sculpture class at Finlandia is part of the art and design core curriculum and is taught by Phyllis Fredendall, a professor of art and design. Her students explore form and materials

working in clay, plaster, wood and fiber. They work with metal wire and salvaged metal, but have not been able to cast metals until this year when Fredendall arranged with Tech's chair of materials science and engineering, Stephen Kampe, to bring her students across the Keweenaw Waterway to work in Tech's foundry.

Kampe and foundry assistant Dale Dewald arranged two sessions for Fredendall's students to work at the facility, where they were able to cast in both bronze and aluminum.

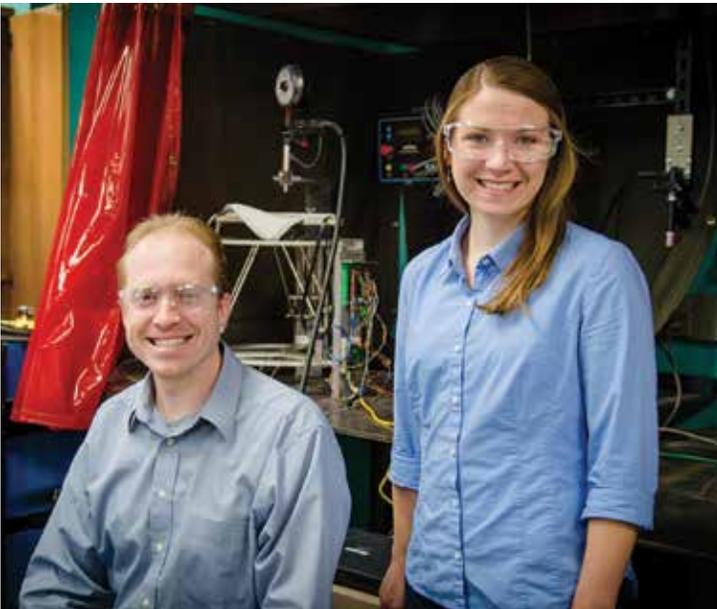
## Outreach



Students of MSE join MSE staff member Ed Laitila (pictured left) in demonstrating the role and importance of material processing variables on the resulting properties of ice cream as part of the Keweenaw Science and Engineering Festival's Nerd Night at the Continental Fire Company in Houghton. After the "lecture," students were able to evaluate firsthand the relevant property known as "taste." The KSEF's mission is to bring the Keweenaw communities together to stimulate and sustain public interest in science, technology, engineering, and math (STEM) by producing and presenting the most compelling, exciting, and educational festival in the Upper Peninsula.

Read more about KSEF at [www.keweenawscience.org](http://www.keweenawscience.org).

## Graduate Student News



PhD candidate **Amberlee Haselhuhn** and Associate Professor **Joshua Pearce** (pictured left) received the Silver Quill Award from Brigadier General Anthony Funkhouser, commander of the Northwestern Division, U.S. Army Corps of Engineers. The Silver Quill Award is given to authors who publish highly selective papers in several of the U.S. military's technical journals. Their paper entitled "Using Intellectual Property as a Strategic National Industrial Weapon: The Case of 3-D Printing" was published in the May–August 2015 issue of *Engineer: The Professional Bulletin of Army Engineers*.

### 2015 Graduate Degrees in MSE

The following students completed graduate degrees in 2014–15: **Andrew Baker** PhD advisor: Stephen Kampe, **Edward Laitila** PhD advisor: Donald Mikkola, **Benjamin Wittbrodt** MS advisor: Joshua Pearce, **Matthew Wong** MS advisor: Paul Sanders, **Yuzhe Zhang** MS advisor: Jiann-Yang Jim Hwang. Congratulations!

## Meet Our New Alumni!



### Congratulations to the MSE Class of 2015!

Left to right: Andrea Paul, Zachary Boyden, Emily Veltman, Nathaniel Musser, Robert Lippus, Robert Cooley, Jordan Pontoni, Kyle Myszka, Shane Anderson, Austin O'Connor, Jacob Gerdt, Austin DePottay, Laura Jewett, Alexandra Glover, Kathleen Ikeda, Jacob Braykovich, Jenna Proctor, Kimberly D'Augustino, Kara Bakowski.

Not pictured: Spring graduates Stephanie Haselhuhn, Alexander Kampf, Calvin Nitz, William Price, Alexander Reinl; Fall 2015 graduates Annie LeSage, Bradley Villeneuve, Mu Yuan

### Nowosad Honored by Alumni Association

Joseph Nowosad '87 was the recipient of the Distinguished Alumni Award by the Michigan Tech Alumni Association. Nowosad serves as Michigan Tech's primary contact with ArcelorMittal and has been instrumental in securing several senior design and Enterprise projects. He is also a member of the College of Engineering Advisory Board. Nowosad's current position with ArcelorMittal is manager of customer technical service for General Motors-NAFTA.



Pictured: Joe Nowosad, second from left, receives the Distinguished Alumni Award from Alumni Association President Edwin Eiswerth, second from right, at the Alumni Banquet in August. Also pictured are MSE Chair Steve Kampe (left) and Michigan Tech President Glenn Mroz (right).

## Alumni Briefs

**Iver Anderson '75** was inducted as a TMS Fellow in 2015. Anderson was cited for his inventiveness that led to lead-free solder used in all electronic devices, for seminal contributions to gas atomization of metallic and polymeric materials, powder metallurgy technology, and rapid solidification processing of a wide variety of materials. Anderson has provided long-time professional leadership as a member of the TMS board of directors and has chaired numerous TMS technical committees.

**Amy Clark '00** was named director of the membership and student development council of TMS. Amy is a materials scientist with Los Alamos National Laboratory and was awarded Tech's Outstanding Young Alumna Award in 2013.

**Peter Enz '13** is pursuing his PhD under Steve Martin at Iowa State University. His research focuses on ion-conducting glasses.



## External Advisory Board

Members of the MSE External Advisory Board (EAB) met on campus in April. The board meets annually with students, faculty, and staff to provide vision and guidance on the department's curriculum and policies. For the first time, the newly organized MSE Industrial Advisory Board (IAB), formed by Associate Professor Paul Sanders, jointly met with the EAB.

Pictured back row, left to right: Paul Sanders (Assoc. Professor, MSE), Greg Jarski (Grede Holdings), Kathy Hayrynen (Applied Process, Inc.), Danielle Rickert (Meritor, Inc.), Evelyn Jackson (ArcelorMittal), Joseph Keske (Waupaca Foundry)  
Front row, left to right: Stephen Kampe (MSE Chair), David Gelwicks (Hickman Williams Co.), Elizabeth Pilibosian (GM Co.), Gregory Olson (Northwestern University)



## Materials Science and Engineering

### 2015 Graduates

BS Graduates—28

PhD Graduates—2

MS Graduates—3

# 2014–15 Enrollment

Undergraduates 129  
Graduate Students 35  
(29 PhD/6 MS)

## Facilities

39,500+ square feet of state-of-the-art laboratory space—with pilot-scale capabilities in all forms of material processing (foundry, deformation, particulate, electronic), and in material structure and property characterization

## Faculty

16 Tenure/tenure track faculty

8 Research faculty

## Faculty Honors/Awards

8 Professional society fellows

3 Endowed professorships

1 AIST Kent Peaslee Junior Faculty Award

1 Faculty (emeritus), National Academy of Engineering

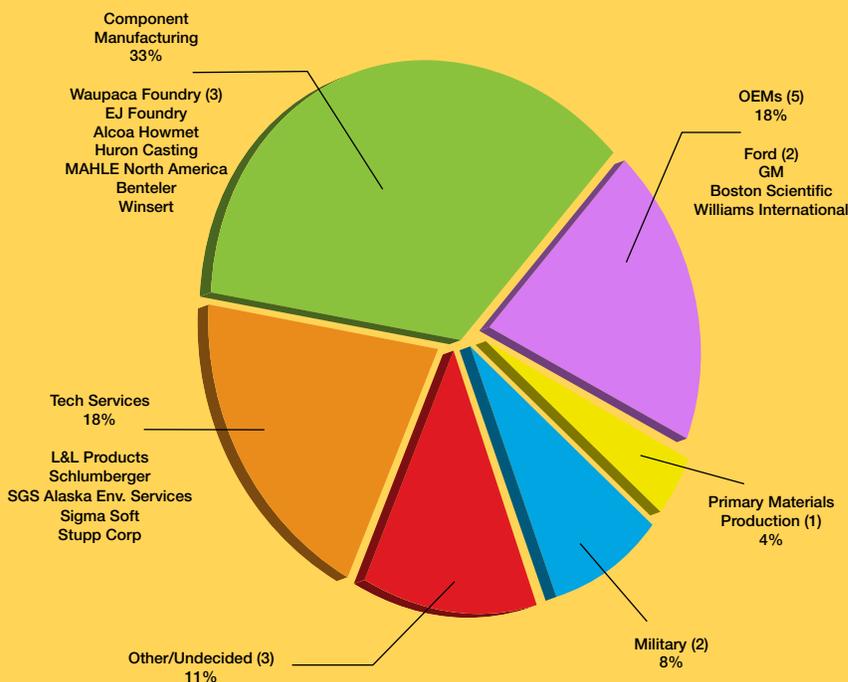


## 2014–15 Placement Stats

300+ companies attended the 2014 Michigan Tech Fall Career Fair

120+ of those companies were looking specifically for MSE students

## Class of 2015 Employment



**90%** of MSE students are employed by commencement day

## General

*U.S. News & World Report* ranked Michigan Tech's PhD in Materials Science and Engineering program as 53rd in the nation in January of 2015

**\$2.3M** external research expenditures FY15  
*according to an NSF survey*

## Endowed Professorships in MSE

Endowed professorships provide extraordinary opportunities for an academic department, its faculty, and students. Endowments last forever; faculty use their earnings to test new ideas, support students, develop new facilities and capabilities, and provide continuity to long-term research endeavors. MSE holds three endowed professorships, established by alumni with a common desire to give back.

### Franklin St. John Endowed Professorship



*Dr. Franklin St. John and grandson, Henry St. John  
(future engineer)*

Franklin St. John '60 describes himself as a grateful alumnus and an enterprising entrepreneur with a simple recipe for success: "education, education, education. Without Michigan Tech, I'd be in the woods working." Following his graduation in 1960, he held positions at Pratt & Whitney, Avco Lycoming, and RX Jeneric Gold Inc. In 1976, he cofounded Jensen Industries, a producer of alloys for dental applications. An avid entrepreneur, he later founded HerbaSway Laboratories, a manufacturer of botanical extracts, herbal formulas and teas.

The Franklin St. John Professorship is provided to the Chair of the MSE department, and generates the means to support a variety of infrastructural improvements, outreach initiatives, and special projects that benefit the broad interests of the department, university, and discipline.

### Charles and Carroll McArthur Endowed Professorship



*Carroll and Charles McArthur, with  
McArthur Professor Yun Hang Hu*

Charles (Mac) McArthur '50 treasured his years at Tech. "It was tough, but it was a great place to go to school. The teachers were so good, so interested in you. They had a great attitude toward the students. The students are important."

Mac spent most of his career at BHP-Utah Minerals, an international mining company.

Charles and Carroll have been great friends to the MSE department. They have funded projects including the McArthur Undergraduate Research Internship program, which has introduced dozens of students to the discovery side of MSE. Professor Yun Hang Hu currently holds the McArthur Professorship and uses the endowment returns to fund student research in alternative energy strategies.

Sadly, Carroll passed away in May 2015. We are grateful to Mac and Carroll and their children Barbara, Chuck, and Catherine for their assistance in enhancing the Tech experience for past and future Tech students.

### Richard Witte Endowed Professorship



*Nancy and Richard Witte*

Following Michigan Tech and three years in the US Navy, Richard (Dick) Witte '50 received a law degree from Indiana University and joined Proctor & Gamble as a patent attorney. He spent 36 years at P&G, retiring as the corporation's Chief Patent Counsel and International Vice President in 1992. During this time, he filed almost 1,400 patents and served on numerous professional and governmental commissions, boards, and delegations.

Michigan Tech was very special to Dick, who would fondly recall his days as editor of the *Keweenaw* and friendships made through involvement in Blue Key, the Theta Tau fraternity, and the Tau Beta Pi and Alpha Sigma Mu honor societies.

Richard passed away in October 2015, eight months after completing the funding of the Richard Witte Endowed Professorship. MSE is grateful to Richard and Nancy, his wife of 59 years, and to their children Elizabeth and Jeffrey for the generous gift that will forever benefit students of Michigan Tech.

A recipient of the Witte Professorship has not yet been named.

For more information about giving to MSE and Michigan Tech, contact MSE Chair Steve Kampe at [kampe@mtu.edu](mailto:kampe@mtu.edu) or Connie Scott in the Office of Development at [cscott@mtu.edu](mailto:cscott@mtu.edu).