

# Mic igan Tec

2017 • VOLUME 54 NUMBER 2

MAGAZINE

HOW  
FUTURE HUSKIES  
WILL GRADUATE  
POISED TO  
SOLVE SOME  
OF THE  
WORLD'S  
MOST  
CHALLENGING  
PROBLEMS

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THE  
MICHIGAN  
TECH  
GRADUATE:

2045

# BETTER CHEMISTRY

WITH  
NANOPARTICLES

Palladium. Platinum. Gold. Ruthenium. There's something noble about Xiaohu Xia's chemistry research. He engineers nanoparticle structures to improve colorimetric assays that detect disease biomarkers.







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### Michigan Tech Magazine

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Ian Repp—Director of University Marketing and Communications

Stefanie Sidortsova—Managing Editor

Jackie Johnson—Art Director

Vassilissa Semouchkina—Graphic Designer

Sarah Bird—Photographer

Shannon Rinkinen—Articles Editor

Sarah Williams—Advancement and Alumni Engagement Editor

Crystal Verran—Director of Operations

Taj Mihelich—Freelance Artist

Marty Richardson—Guest Writer

Austin Thompson—Freelance Photographer



Comments to the editor:  
magazine@mtu.edu

Website:  
mtu.edu/magazine

Class Notes submissions and mailing address changes:  
alumni@mtu.edu

Michigan Technological University is an equal opportunity educational institution/ equal opportunity employer, which includes providing equal opportunity for protected veterans and individuals with disabilities.




## THE ANATOMY OF . . . THE HUSKY STATUE

### IN JUST THREE YEARS,

this larger-than-life dog has become an icon on campus. He's donned a white coat for National Engineers Week, sat nicely for thousands of photo ops (er, selfies), and provided a centrally located meeting spot on campus ("Let's meet at The Dog . . . no, not THAT Dog.") 🐾

Learn more about our beloved statue at the heart of campus.



The proud pup sits on a **25-ton, 1.8 billion-years-old** boulder—a gift from civil engineering alumnus Roland Huhtala '74—harvested from a quarry near Covington, Michigan.

**BIRTHDAY**  
**OCTOBER 13, 2014**

**BIRTHDAY**



**H E I G H T**

**W I D T H**  
**3'**

**9' 1"**

**H E A D  
T O  
T A I L**

**9' 3"**

**P R E F E R R E D  
N A M E**

**THE DOG/  
THE ROCK DOG/  
THE HUSKY STATUE—  
JUST DON'T CALL HIM BALTO, PLEASE.**

**P R E F E R R E D  
P R O N O U N S  
H E / H I M / H I S**

**W E I G H T**

**1,600 LBS**

**S C U L P T O R  
BRIAN HANLON  
OF HANLON SCULPTURE STUDIO**

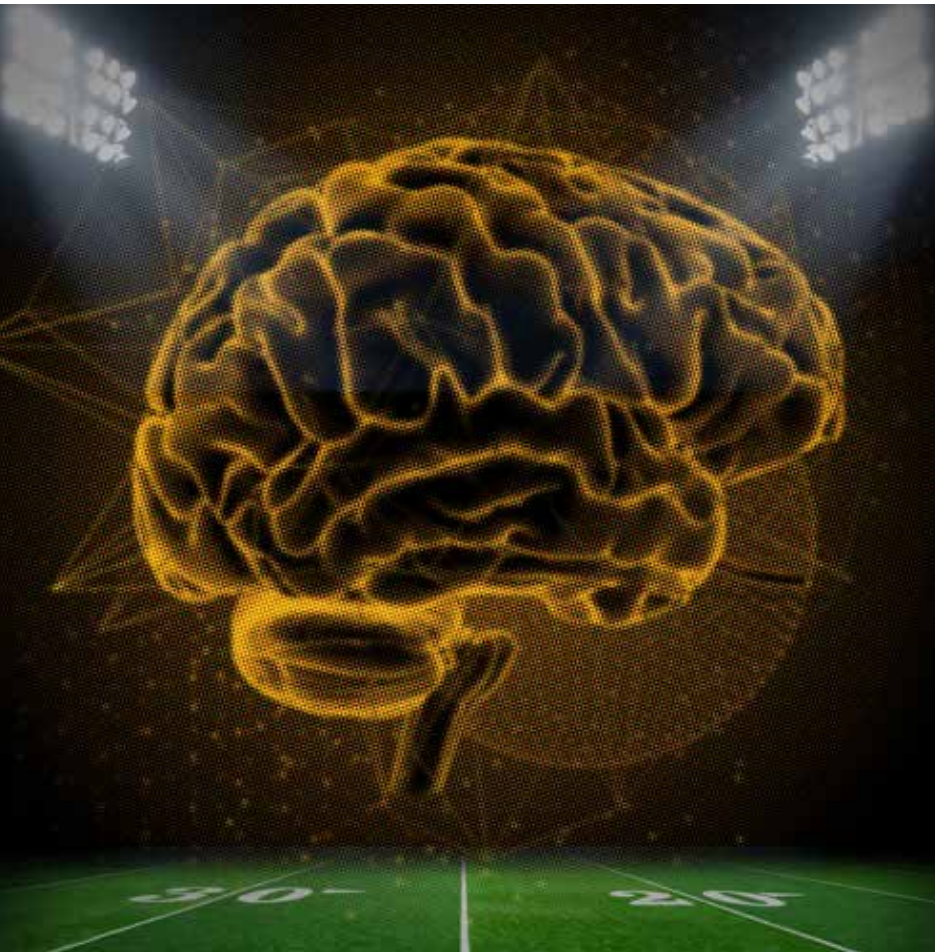
**WE ❤️ OUR  
DONORS**

OUR HUSKY STATUE WAS MADE POSSIBLE  
THANKS TO DAN (1945–2015) AND JOAN  
LORENZETTI, FRIENDS OF MICHIGAN TECH.



Knock, knock. What's inside? Nothing! This Husky is made from a hollow, bronze casting. 4,500 pavers—including 1,030 personalized, engraved pavers—surround The Dog in an area of campus known as Husky Plaza. (Find your paver at [mtu.edu/alumni/recognition/plaza](http://mtu.edu/alumni/recognition/plaza).)





# YOU ALREADY KNOW MICHIGAN TECH ATHLETES ARE CRAZY SMART— BUT JUST HOW SMART?

Huskies are here to work hard in the lab and classroom—and out on the field, court, and ice. “Our athletic teams are as dedicated to earning their degrees as they are to winning championships. Their ‘smarts’ are an advantage in high-pressure situations—and it really sets us apart. Michigan Tech student-athletes raise the bar with their overall GPA, retention, and graduation rates,” says Suzanne Sanregret ’93 ’06, athletic director, Michigan Tech.

**3.26**

AVERAGE GPA  
(GENERAL STUDENT POPULATION-3.07)

**203 RECEIVED**

ACADEMIC ALL-CONFERENCE  
RECOGNITION

**3 ACADEMIC**

ALL-AMERICANS

**58.2 PERCENT**

ENGINEERING MAJORS

**85.6 PERCENT**

RETENTION RATE

**72 PERCENT**

GRADUATION RATE  
(FIVE-YEAR AVERAGE)

(2016-17)

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# MIT, JOHNS HOPKINS, CALTECH, GEORGIA TECH, AND MICHIGAN TECH

Earlier this year, *Forbes* named the top 25 colleges and universities in the nation for STEM (science, technology, engineering, and mathematics) and—no surprise—Michigan Tech made the cut.

The prestigious list includes MIT, CalTech, Carnegie Mellon, Johns Hopkins, and Georgia Tech.

**Read and share, Huskies!**

[mtu.news/2v2eNzr](http://mtu.news/2v2eNzr)

A **STEM** college is defined as one where more than 50 percent of the majors are in STEM fields.

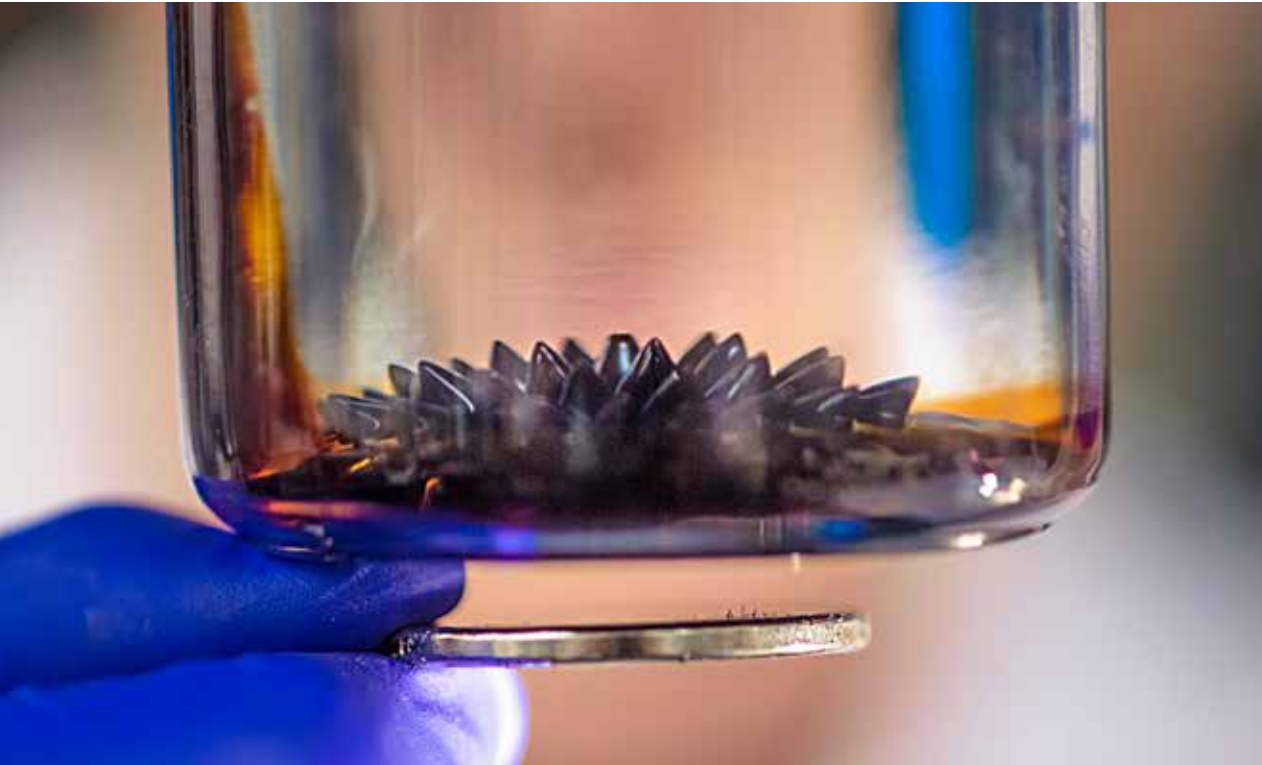


**“IT IS EXCITING TO SEE THE  
INCREASING RECOGNITION  
OF THE HIGH QUALITY  
AND ACCESSIBILITY  
OF A MICHIGAN TECH  
EDUCATION.”**  
– MICHIGAN TECH PRESIDENT  
GLENN MROZ '74 '77





# AIR FORCE FUNDS MICHIGAN TECH RESEARCH



**THE TINY THRUSTER REQUIRES NO FRAGILE NEEDLES AND IS ESSENTIALLY INDESTRUCTIBLE. THE PEAKS ALSO HEAL THEMSELVES AND REGROW IF DAMAGED.**

What's magnetic, ionic, and can turn spiky like a hedgehog? Ferrofluids. What's the big deal? Michigan Tech researchers are looking to these needle-like jets of ionic fluid in hopes they'll one day propel small satellites through space.

Approximately 1,300 active satellites currently orbit the Earth. Some are the size of a school bus, others the size of a smartphone. And more than 9,000 new satellites will be launched in the next 10 years. Most small satellites don't move by themselves, so researchers are looking at ways to propel them once launched into low-Earth orbit.

One method of micropropulsion involves microscopic, hollow needles that use electricity to spray thin jets of fluid, pushing the spacecraft in the opposite direction. But the needles are intricate, expensive, and easily destroyed.

To solve this problem, L. Brad King, Ron and Elaine Starr Professor in Space Systems at Michigan Tech, is creating a new kind of microthruster that assembles itself out of its own propellant when excited by a magnetic field.

"We're working with a unique material called an ionic liquid ferrofluid," King says, explaining that it's both magnetic and ionic, a liquid salt. "When we put a magnet underneath a small pool of the ferrofluid, it turns into a beautiful hedgehog structure of aligned peaks. When we apply a strong electric field to that array of peaks, each one emits an individual micro-jet of ions."

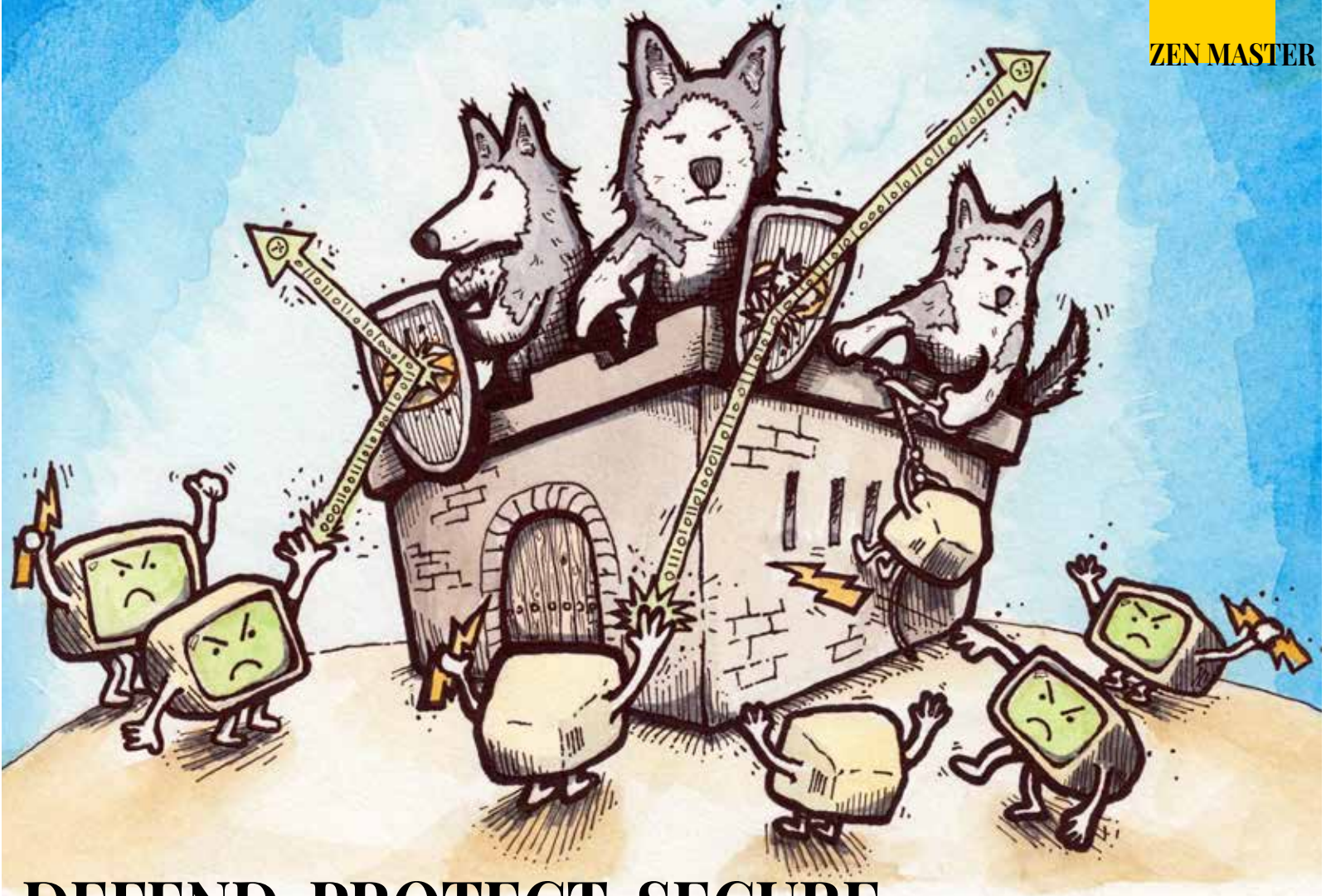
This year, the Air Force Office of Scientific Research (AFOSR) awarded King a second contract to continue researching the physics of ferrofluids. "Instead of modeling a single peak, we'll scale it up and model multiple peaks."

The team is also collaborating with Juan Fernandez de la Mora, a professor of mechanical engineering and materials science at Yale University, one of the world's leading experts in electro spray.

In addition to spacecraft propulsion, ferrofluid electro spray technology could be useful in spectrometry, pharmaceutical production, and nanofabrication. Michigan Tech has a pending patent for the technology.

**Get a look at what's happening inside our Ion Space Propulsion Laboratory:**  
[mtu.news/2u1HNZX](http://mtu.news/2u1HNZX)





## DEFEND. PROTECT. SECURE. MICHIGAN TECH'S NEW MASTER'S IN CYBERSECURITY PROGRAM

"Cybersecurity is both a research problem and an education problem," says Jean Mayo, associate professor and graduate program director, computer science, Michigan Tech.

Attacks on computer systems are new, innovative, and fast. Michigan Tech is helping create a workforce ready for the challenge.

Launched in 2016, Michigan Tech's master's degree in cybersecurity was the first graduate program of its kind in Michigan. Other schools are catching on, but our program is still unique.

"Our MS in cybersecurity is special because of the combinations of learning environments. Our computer science department, the electrical and computer

engineering department, and our School of Technology joined forces to provide a foundation in information confidentiality, integrity, and availability across disciplines. This gives our students exciting education and research opportunities," says Min Song, Dave House professor and chair, Department of Computer Science, Michigan Tech.

Students choose from one of three specialized tracks: Trusted Software Engineering, Critical Infrastructure Protection, and Network Security Management.

The program is also available as an accelerated master's degree (bachelor's and master's degree in five years).

Electrical engineer Ryan Olson '14 was working for an oilfield service company

when he started to think about pursuing a master's degree. "The company I was working for was going to transfer me out of the country. My academic advisor told me about this new option, and I decided to pursue it. I'm using my electrical engineering background to focus on industrial control system security."

Olson, one of the first students to enter the program, aims to graduate in 2018. "It's nice to be back 'home' at Michigan Tech, and I'm excited about where my new career will take me."

**Know someone who might be interested? Get the details and apply for free:**  
[mtu.edu/gradschool/programs/degrees/cybersecurity](http://mtu.edu/gradschool/programs/degrees/cybersecurity)

NO  
BUSINESS  
LIKE

# SHOW BUSINESS

**Michigan Tech's Visual and Performing Arts (VPA) alumni are in the spotlight—and behind it. They bring audiobook characters and Marvel Comics superheroes to life. They're aspiring stuntwomen, and international ambassadors creating soundscapes for studios, stadiums, and world-renowned concert venues.**

## ***In St. Petersburg, Florida,***

Paige Borel is training: aerial arts classes, gymnastics, dance classes, and intensive workouts. "I'm passionate about acting and stunt work, and I'm planning to attend and graduate from a stunt school in the next year," says Borel, a lifelong dancer who received her BA in Theatre and Electronic Media Performance in 2014. "I always knew that I wanted to have a career in the performing arts industry. When I enrolled at Tech I was a business major." But the night before classes began her junior year, Borel spontaneously added VPA courses. By the end of the week she'd switched majors. Her favorite classes at Michigan Tech were scene studies and performer flying. "Learning how to fly, flip, and perform in harnesses paved the way for me to expand into becoming a stuntwoman."

***"Learning how to fly, flip, and perform in harnesses paved the way for me to expand into becoming a stuntwoman."***

***—Paige Borel '14***



## Somewhere in the US,

Tyler Harry '15 is on tour with Spiderman. An assistant performance rigger with Feld Entertainment's Marvel Universe Live: Age of Heroes, Harry's the man who makes the superhero fly. He's been part of the Marvel crew since August 2016. "It's my job to make sure everything is safe to use, because at the end of the day I'm going to have someone's life in my hands. We had a little over two months of building this show in the shop, which is in Florida, and started touring June 12. We work our way from the west to east coast the next two years. I love my job. Not only do I get to work in the field I am most interested in and travel all around the world—I get to fly super heroes! Who else can say that? One of my favorite moments during a show:

one of my cues was to fly Spiderman on a line; he swings over the audience. There was this little boy dressed up as Spiderman who jumped out of his seat and reached up to wave to the real Spiderman. This little boy was jumping up and down and grabbing his mom. I never realized until then how much I enjoy seeing people so excited and so into the show I am working on."



Feld Entertainment/Marvel

## No People Like Show People

No matter where they are, VPA grads credit faculty that worked alongside them—and leveraged solid career and alumni networks—to open industry doors. Case in point: faculty and alumni are strengthening Michigan Tech's Cirque De Soleil connection. Jason Scott '17, who completed bachelor's degrees in both theatre and entertainment technology and mechanical engineering, was the first VPA student to intern with Cirque, in summer 2015, says professor Mary Carol Friedrich, theatre and entertainment technology program director. In summer 2016, two more VPA students also interned with Cirque.

"Cirque normally receives 400 applications from all over the country, and only interview 40 people for 26 slots, so it's rare for any university to provide more than one intern, much less three," says Friedrich. "We've had several subsequent conversations with Cirque at the United States Institute for Theatre Technology (USITT) annual conference, discussing our program and what we can do to continue to enhance the student experience here to make it advantageous for their future careers."

***"I love my job. Not only do I get to work in the field I am most interested in and travel all around the world—I get to fly super heroes!"***

**-Tyler Harry '15**



Photo by Travis Maynard

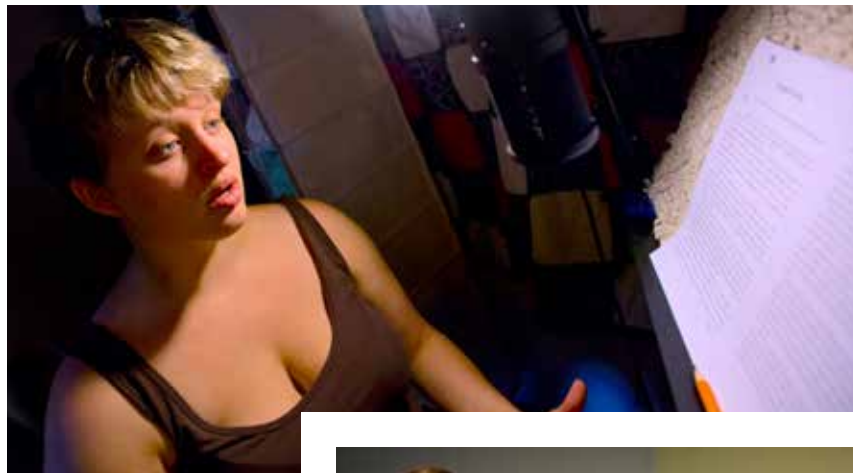




## In L'Anse, Michigan,

Dollcie Mueller fits in a recording session for her fourth audiobook while her six-month-old daughter sleeps. Mueller, BA Theatre and Electronic Media Performance '16, works from home in a sound-treated closet. "Me 'in action' consists of reading the book, rereading it a chapter at a time, recording that chapter, and then spending an hour or so editing on the computer before I submit it for the author to listen to. I'd like to upgrade to a whisper room (an independent, essentially noise-canceling room) but those cost thousands of dollars. So right now I'm making do with quilts, carpeting, and foam padding attached to the walls," she explains. "I have my mic hanging over a heavy-duty music stand, running an XLR cable to my preamp in the main room. It's a nice setup. I just pull up Reaper [a digital audio production app] on the computer, click 'Record,' and take a couple steps to the closet where I can start reading."

To read more about VPA graduates in and behind the spotlight, check out our digital magazine at [mtu.edu/magazine/showbusiness](http://mtu.edu/magazine/showbusiness).



## Archaeology Grad Is In On The Act

Industrial heritage and archaeology graduate Marc Henshaw '07 '14 parlayed a passion for his major into a show business gig. Henshaw, a 2007 undergraduate who went on to earn his PhD in industrial archaeology from Tech (he earned his master's in anthropology from Western Michigan University), became an onscreen consultant for the National Geographic television show *Diggers* right out of school.

"I graduated in August 2014 and by the end of the month I was with the film crew," says Henshaw, onscreen consultant for the 10 episodes of the show's fourth season.

The Pittsburgh, Pennsylvania-based firm Michael Baker International called him after it was hired as consultant for *Diggers*, which like other shows in the metal-detecting, dig-it-up reality TV genre, faced growing backlash concerning ethical practices. Henshaw had been following the controversy. "They showed all manner of horrible looting, from the use of backhoes to monetizing the artifacts. I wrote a scathing blog post denouncing these shows and worked with my local advocational archaeological societies in letter-writing campaigns. The Society for American Archaeology (SAA) and the Society for Historical Archaeology (SHA) also began an aggressive campaign to have these shows pulled off the air," he says.

In response, the shows' producers partnered with the SAA and SHA to review every episode before it aired and to remove the monetization of the artifacts. Baker wanted someone with a high ethical standard who wasn't afraid to be a stickler for regulations, recording of finds, and treatment of the artifacts. He chose Henshaw.

"The show had its detractors, even after I was on," says Henshaw, who continued working with Michael Baker International into 2017, when he helped open a Detroit branch of the company. Currently he's focused on publishing the research he conducted at Michigan Tech and his archaeology blog, [archaeologydude.com](http://archaeologydude.com).

# CAUSE-DRIVEN LIFE

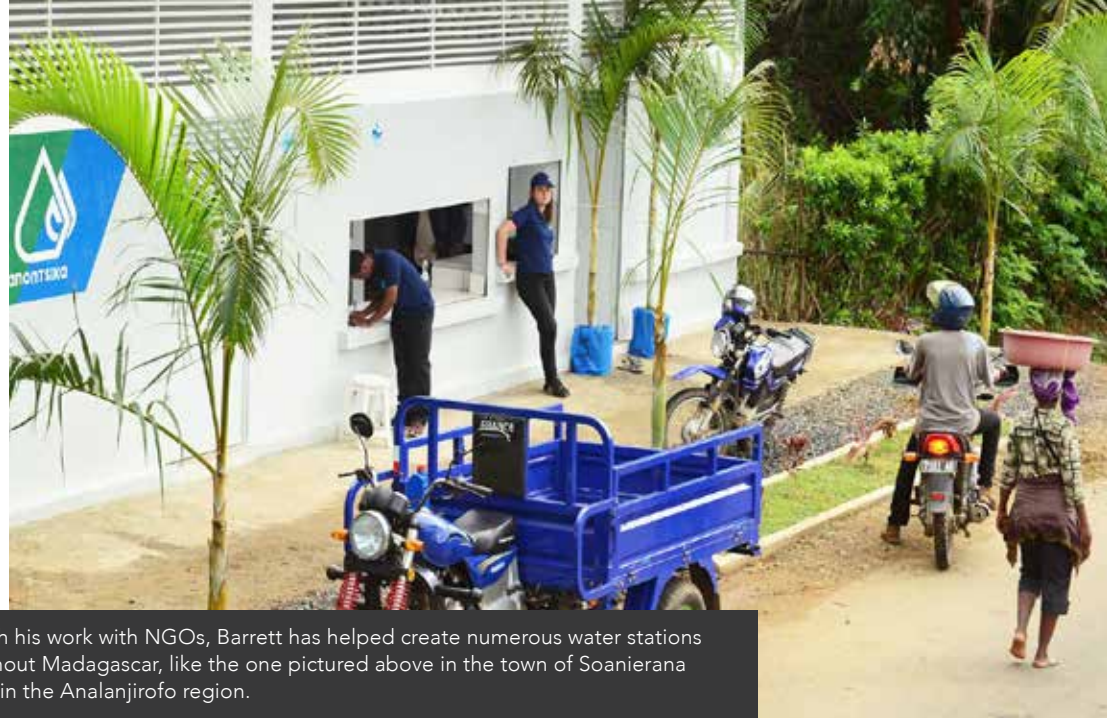
Environmental engineer **Luke Barrett '13** (front row, far left) works to make potable water readily and affordably available to remote communities in Madagascar.

**R**anontsika means “our water” in Malagasy, the primary native language spoken in the island nation of **Madagascar**. And water—safe, drinkable water—for the people of Madagascar has become Luke Barrett’s life’s work.

Barrett, a Michigan Tech Peace Corps Master’s International (PCMI) program alumnus who received his MS in Environmental Engineering in 2013, is the founder of Ranontsika, a non-governmental organization (NGO) that builds small water production plants to treat and deliver safe drinking water to communities in rural and urban Madagascar.







Through his work with NGOs, Barrett has helped create numerous water stations throughout Madagascar, like the one pictured above in the town of Soanierana Ivongo in the Analanjirifo region.

Located in the Indian Ocean off the southeast coast of Africa, Madagascar presents a plethora of problems for environmental engineers like Barrett, who would make potable water readily and affordably available. Believed to have split off from the Indian peninsula some 88 million years ago, the entire eastern coast of the fourth largest island in the world is ridged by a steep, rocky slope. The rest of the island ranges from tropical rainforests to dry, desert-like shrublands, to mangrove swamps. Not the most hospitable terrain for people or for engineering projects.

"There's a lack of reliable infrastructure in the urban areas, a lot of poverty, and about 70 percent of the people live in small villages and towns with limited accessibility," says Barrett.

He's facing other challenges, too: electricity that goes off without warning, internet service that grinds to a halt, government bureaucracy that slows things down to a crawl.

Barrett's interest in drinking water began in a lab, where he hoped to develop a natural coagulant for water treatment. That project didn't pan out, and after his Peace Corps service in Madagascar, he took a job with BushProof, a humanitarian enterprise that specializes in developing custom water supply technologies for remote regions. There, his attention turned to water quality and analysis.

"It's drinking water in the context of engineering and design, business and international development that really interests me," Barrett explains. So he joined a French NGO called 1001fontaines, whose goal is to bring safe drinking water to 1 million people by 2020. As 1001fontaines' Madagascar project manager, he founded Ranontsika to implement 18 new water stations—micro water treatment plants run by locally recruited entrepreneurs. "Kind of a franchise model," Barrett calls it. So far the NGO has completed 11 stations. They aim to complete the other seven by mid-2018.

"We then plan to spend about a year going back and looking at the details of how the stations work, tweaking the technical, managerial, and business aspects," Barrett says.

He's particularly engaged with 1001fontaines' service model. "They not only focus on water quality, but on developing a viable business model for delivering it to the beneficiary.

Engineering a quality product as well as making sure it can be implemented in a sustainable fashion is something that keeps me interested in the work."

What does the future hold for Luke Barrett? At least five more years in Madagascar, perfecting and documenting what he calls an "operator-friendly, modular technology and service model that can be scaled elsewhere." He wants to stay engaged with the details of the work. "I guess that means developing as a research and development professional. At least that's one track. The other track is to build a small cabin on a river somewhere and go live quietly."

Based on Barrett's work so far, track two may be appealing, but it's much less likely.

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**"IT'S DRINKING WATER IN THE CONTEXT OF ENGINEERING AND DESIGN, BUSINESS AND INTERNATIONAL DEVELOPMENT THAT REALLY INTERESTS ME."**



**It was the honeymoon of a lifetime.** Jim and Jan Tanis traversed the slopes of Mount Kilimanjaro, crossed Tanzania on safari, and finished their journey by visiting the mountain gorillas in Bwindi National Park in southwestern Uganda.

At least they thought they were finished. While they were in **Bwindi**, they met Brian, a child of clear promise whose access to education was virtually non-existent. Their hearts were touched; they couldn't get Brian out of their minds.

For a year, they sponsored the boy in secondary school in Rukungiri, a rural town not far from Bwindi. He has since gone on to law school, where he is studying human rights law with the help of another sponsor. But there were so many more children in Bwindi, in a village called Buhoma. Public schools in Uganda are few and far between, and while there is some government support for secondary schools, they are not free, so the children in poor, remote areas like Bwindi make do with spotty education, if that.

So in 2010, the Tanises established a charity called the Bwindi Community Program (BCP), at its heart, a primary school called **Bwindi Watoto. (Watoto means children in Swahili).** They sought sponsors for children to attend the school. The first year, there were 20 sponsored children. By 2015,

that number had grown to 131, and their education ranged from primary through secondary school, vocational training, and university courses.

A Michigan Tech alumna with a BS in Geological Engineering and an MS in Geophysics, Jim Tanis '57 '58 is a retired oil company exploration geophysicist who spent 21 years with ConocoPhillips Worldwide and eight years with Shell Oil. He has lived in six countries and traveled extensively in developing regions. His life and work have given him a deep understanding of cultural diversity and the value of education in lifting people out of poverty and despair.

Jim is president of the BCP board of directors, which is made up primarily of US and Ugandan volunteers, and Jan is its treasurer. Jan is a retired controller for First Martin Corporation who has worked in commercial real estate development and management and served on a planning and zoning commission. Her role as treasurer is a key one: ensuring that the nonprofit stays in compliance with 501c3 regulations. She also is the link between the sponsors and students in the program, communicating with the students, reporting on their academic progress to sponsors, and coordinating the care of students with support on the ground in Uganda.

BCP is constantly seeking sponsors for students: children like Linnet, who loves science and wants to be a midwife. She has six brothers, only one of whom attends school. She will graduate from primary school this December (2017). But her education will stop there, Jim says, unless a sponsor is found.

The charity has also undertaken a number of school improvement projects, such as stabilizing the water and power on the campus. Currently they are trying to raise \$70,000 for an e-Library, to provide internet connectivity for research. The library will have study space for 140 students, open to the community. "It will be the first such facility in the district, and it's warmly anticipated by all," the Tanises say.

"The challenge keeps us actively engaged in helping a part of the world that so greatly appreciates the time and effort it takes to educate and support their children," he says. "We saw a need and are trying to fill it."

**To sponsor a child, visit:**

[bwindicommunityprogram.org/payment/index.html](http://bwindicommunityprogram.org/payment/index.html)

**To donate in some other way to Bwindi Community Program, go to:**

[bwindicommunityprogram.org/other/donations.html](http://bwindicommunityprogram.org/other/donations.html)



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**"THE CHALLENGE KEEPS US ACTIVELY ENGAGED IN HELPING A PART OF THE WORLD THAT SO GREATLY APPRECIATES THE TIME AND EFFORT IT TAKES TO EDUCATE AND SUPPORT THEIR CHILDREN."**

Jim and Jan Tanis sponsored Brian throughout secondary school in Rukungiri, a remote town in Uganda. He is now a law student in Kampala, the country's capital city. He focuses his studies on human rights.

## iving Life Without Labels.

That's the motto of Sanna Roling's Dream Catcher Stables, an all-volunteer public charity in Houston, Texas, that teaches disabled and at-risk youth how to ride horses.

Roling, a Michigan Tech alumna who earned a BS in Biological Sciences in 1967, fell in love with horses while she was growing up in Wheaton, Illinois—but she never owned one. Instead, she earned her Girl Scout horsemanship badge and went to work at a nearby stable in exchange for riding lessons. "I spent my summers at the stable," she recalls.

Now her Dream Catcher Stables has nine horses—including thoroughbreds, cutting horses, dressage horses, and a mutt named Smut—all donated and used in its therapeutic riding program. Volunteers—134 of them—teach people with disabilities to ride and care for horses, while helping their families navigate their challenging lives. These volunteers contributed 4,174 hours during 2016. By mid-2017, 48 youth had already received riding lessons.

Running an operation like Dream Catcher wasn't always part of the plan. Roling initially wanted to become a veterinarian before majoring in biology at Michigan Tech. She then headed to the University of Massachusetts to work on her master's degree in chemistry. She met her husband, Paul, there, then raised two children before getting certified as a special education teacher in Texas.

And Roling never stopped riding. She learned that the San Jacinto Girl Scout Council had

a riding program, but wouldn't allow disabled girls to ride. Roling was incensed. "Of course these girls can ride horses," she insisted. She took disabled Girl Scouts to the horse camp and demonstrated that they could ride. She went on to head a special ed riding program at the San Jacinto Girl Scout Camp.

Roling also brought a special ed program to the Spring, Texas, Independent School District. She taught academics through horse language: math meant measuring food for horses, English involved horse and riding terminology. "And it worked" she says. "But we had no horses." So the program shut down.

In 1987, the Special Olympics Texas Area 4 asked her to bring riding to the games. She served as equestrian event director for seven years and world games equestrian coach for the 1995 Special Olympics.

Inspired by the impact she saw that horseback riding had on Special Olympics athletes, Roling established a riding program in the Houston area, but internal politics prevailed, and it did not work out. In August 1999, Roling tried again, incorporating Dream Catcher Stables. After two struggling years, she obtained a lease on 98 acres of raw land where Dream Catcher Stables now stands, inside the city limits of Houston. The land has since been sold to an investor who is permitting Roling to keep her stables there until he sells the property.

The work Dream Catcher does is not "therapy," Roling stresses. "I have no medical or therapeutic training. What we offer is recreation/education/

sport riding. We teach them to ride and to groom and saddle a horse."

The stable also works with youth ordered by the court to do community service. "These are troubled kids," Roling says frankly. "They come thinking they are going to get to ride horses. I hand them a rake or a shovel or an old-fashioned

push mower and put them to work. And 95 percent of them straighten their lives out."

Dream Catcher Stables has been named a GuideStar Platinum Seal Charity—the nonprofit evaluation program's highest ranking. Great NonProfits, another charity assessment organization, ranked it a Top Rated Charity in 2016



"OF COURSE

CAN I  
HORSES."





and 2017. The Michigan Tech Alumni Association recognized Roling with its Humanitarian Award this year.

But Roling is far from satisfied. She's launched a capital campaign to buy a permanent home with an indoor arena and a classroom, and she has more plans: become accredited by the Certified Horsemanship Association and Path International, establish an endowment fund, start a weekday program (the riding is now only on weekends), and increase the number of volunteers to serve more people.

Roling sums up her passion in Dream Catcher Stables' mission: "to provide a place where people with disabilities can be equal, capable and successful, growing to their maximum potential through interaction with horses in a positive environment."



# HURRICANE HARVEY

On August 25, Hurricane Harvey made landfall in Texas as a Category 4 storm. The next day, the hurricane flooded Houston, including Sanna Roling's Dream Catcher Stables.

"Harvey challenged our horses," says Roling. "The waters rose waist deep at the entrance. People had to wade in to feed the horses, but they took care of them every day of the hurricane. Their pasture had high ground, and their stalls protected them from the rain. Our hay container took on a bit of water, damaging approximately 50 bales of hay. We've stopped the leak and more hay is on order. Our tack room took on at least two inches of water."

Dream Catcher's annual fundraiser had to be canceled because LoneStar College Kingwood—also flooded out by Harvey—had to occupy the venue. Roling is now hosting a different kind of fundraiser, "10 for 10." Each volunteer and athlete family is being asked to donate \$10 and ask 10 of their friends or businesses they patronize to do the same.

"Our property floods every time it rains, so we really must move," Roling says. Higher land has been located, and Dream Catcher Stables is working on raising money to purchase it.

**To donate to Dream Catcher Stables:**  
[paypal.com/us/fundraiser/charity/1207722](https://www.paypal.com/us/fundraiser/charity/1207722)

## MEET SOME OF THE KIDS WHOSE LIVES HAVE BEEN CHANGED BY DREAM CATCHER STABLES.



Draylon first came to Sanna's stables as an elementary school student in a wheelchair. Today he rides horses—and walks. "His parents swear that he walks because he rode our horses," Roling says.



Blake had some behavioral issues when he arrived at Dream Catcher Stables. Within a year, he became an independent rider. Next came walking and trotting. Now he's working toward a lope. And he has been inducted into his school's National Junior Honor Society two years in a row.



Gracie needs structure and clearly defined goals to avoid seizures and process ideas properly. Her horse-oriented mother leads the girl around on her horse, but Gracie's personal goal is to ride independently.



# THE MICHIGAN TECH GRADUATE

# 2045

In 2045, automation is king. Cars are not only self-driving, they're getting ready to take flight. The US population is nearing 400 million, and the next evolution in urban renewal is underway. Technological advances are a daily occurrence, and robotization has changed the face of production and the workforce.

Isaac Matthews, '45  
Major: Sustainability  
Birthday: July 22, 2023  
Age: 22  
From: Detroit, MI

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Camila Romero, '45  
Major: Biomedical Engineering  
Birthday: March 26, 2023  
Age: 22  
From: Salt Lake City, UT



Meet Camila Romero and Isaac Matthews. They are among the students preparing to graduate as part of Michigan Tech's class of 2045. Michigan Tech is 160 years old; the Portage Lake Lift Bridge is 86. Camila and Isaac were born in 2023, just six years from now. (Their parents may even be members of Michigan Tech's 2017-18 entering class.) These students have had an educational experience very different from that of today's students. But they are uniquely prepared to tackle the issues facing their generation.

Portrait of 2045: The portion of Michigan Tech's Strategic Plan that contemplates the University's existence several decades into the future. Some of these characteristics are captured in figures—target numbers for enrollment, for diversity, for endowment. Other characteristics are harder to quantify: globally literate graduates with strong communication skills; a transformational undergraduate experience in a residential learning environment; a university culture that is entrepreneurial, efficient, service-oriented, and sustainable.

But a portrait is not supposed to be a detailed description; it's a likeness—open to individual interpretation and context. Here, we capture various versions of the Portrait of 2045, through the eyes of some of the University's thought leaders, and in the creation of two fictional members of the class of 2045.

*"We need to make sure we're positioned to give students the skills they need to solve problems. Part of that comes from training in an academic discipline. In addition, there are a lot of things students need that aren't taught in courses. Things like interpersonal skills, social engagement and habits of mind: problem solving, creativity, innovation, critical thinking, entrepreneurship."*

—Jacqueline Huntoon, Provost and Vice President for Academic Affairs

The sun shines brightly on a May morning in 2045. Overhead, camera drones zip back and forth, jockeying for position above the line of graduating seniors. Camila Romero looks around at her peers, excited for the future, but a little apprehensive, too. In front of her, another student chats with his mother's image on his hologram watch.

"Camila!" someone shouts. She turns toward the voice and sees her best friend, Isaac Matthews, jogging over, his mortarboard askew.

"You should fix your hat, Isaac," she says with a smile. Isaac shrugs his shoulders, and Camila knows what he's about to say next.

Camila and Isaac met freshman year in their Global Issues class. The two were paired together in a month-long exercise to formulate and address a sustainable development problem. The project was part of a collaboration between Michigan Tech and a university in India, where first-year students were enrolled in a similar class. Along with their counterparts overseas, Camila and Isaac did a comparative study of the efficiency of microgrids in a rural section of the Upper Peninsula with a rural village in India.

The project would influence their next four years at Michigan Tech.

*"You hear a lot of people saying we won't need classrooms (in the future educational setting). But research shows learning is a very social activity. We learn from bouncing ideas off each other and arguing with each other. We learn from other points of view. There still needs to be someone who facilitates that learning and pushes people to think outside the box, who pushes people to see issues from multiple perspectives. Teachers and professors aren't going away, but their role may be different."*

—Shari Stockero, Director of Teacher Education, Cognitive and Learning Sciences

Their Global Issues professor gave them A's for what she called preliminary work. "If you want to continue with this project," she said, "we can meet with the Academic Innovation department to modify your curriculum."

After a couple hours of in-depth discussion on the back deck of the Downtowner, looking out on the Keweenaw Waterway,

Camila decided to stick with her original plan to major in biomedical engineering. As much as she enjoyed her microgrid experience, her true passion lay elsewhere. Plus, a conversation with one of her team members in India had sparked an idea for a technology that would help heal wounds faster.

Isaac, on the other hand, had started his first year of college with far less career certainty than Camila. Hoping to find a profession that would be spared from death-by-automation, he'd been on the "general" track in Michigan Tech's sustainability program. Now that he'd discovered how sustainable energy systems could help underserved communities, his path was coming into sharp focus.

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**"You hear a lot of people saying we won't need classrooms (in the future educational setting). But research shows learning is a very social activity."**

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The Michigan Tech of 2045 will continue to attract the nation's brightest minds to Innovation Shore thanks to its interdisciplinary approach and commitment to technologies and innovations that have immediate, real-world applications.

*"There are many paths to the same route. [Students] understand learning as a social process. It's absolutely ridiculous that we would put barriers in their way in terms of access to information or people who can help them learn. We impose artificial deadlines on students and they smell that. The system has to be more honest and flexible about that."*

– Mike Meyer, Director of the William G. Jackson Center for Teaching and Learning

The world Camila and Isaac have inherited is vastly different from the one we know today. Every technology they work with, improve upon, or develop as first-year students will be out of date by the time they reach their fourth or fifth year.



In his introduction to *The Fourth Industrial Revolution*, Klaus Schwab, founder of the World Economic Forum, describes the pace of profound shifts in the ways humans live. Around 10,000 years ago, he notes, the first shift occurred when people transitioned from foraging to farming. Food production slowly improved, leading to larger human settlements, urbanization, and cities.

But thousands of years passed before the next major shift would occur. It was not until the second half of the 18th century that mechanical inventions gave birth to a series

of industrial revolutions. Each innovation—railroads and the steam engine; electricity and the assembly line; computers, personal computers, and the internet—demanded more highly skilled workers than the last.

We are now, according to Schwab, at the dawn of a fourth industrial revolution (hence the title of his book).

This revolution is characterized not only by smart, connected machines and systems, but also by a wide-ranging scope of breakthroughs. "It is the fusion of these technologies," he argues, "and their interaction across the physical, digital and biological domains that make the fourth industrial revolution fundamentally different from previous revolutions."

While thousands of years passed between the first revolution and the second, and hundreds of years between the second and third, the third and fourth revolutions were separated by mere decades. Today,

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**"[Students] understand learning as a social process. It's absolutely ridiculous that we would put barriers in their way in terms of access to information or people who can help them learn."**

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technologies are upgraded, or rendered obsolete, on a basis that is both rapid and gaining speed.

*"A new approach we're exploring with the undergraduate curriculum gives students a more hands-on experience. The traditional engineering education is based on lectures, but research suggests that students learn better when they can get involved in practice activities centered on the learning material. Instead of having labs, we have developed practice sessions. Also, the projects are open-ended. That is, there is no definite right or wrong way to solve the problems we give them. They learn to use engineering tools to come up with a solution that meets the given requirements. We're asking them to interact with teammates, be creative, and to use critical thinking to realize their design. The employers like it. They believe the engineers they hire out of Michigan Tech are prepared to hit the ground running and think for themselves."*

—Gregory Odegard, Richard and Elizabeth Henes Professor of Computational Mechanics, Mechanical Engineering—Engineering Mechanics

As part of her curriculum design, Camila joined a first-year Enterprise team who lived together in one of the sustainable tiny house communities scattered about campus. While she worked on a biosensor project to help her peers achieve more and better sleep despite the pressures of college, her team members developed an ultra-light material in which sleep sensors were embedded for their peers to curl up in at night. They called the special hammocks Catnap Cocoon.

Throughout her second and third years, Camila worked on several research projects, diversifying her skill set and knowledge base for a market that had seen nothing but rapid change for the past two decades. She had been primary research assistant to the professor who developed biosensors that could be inserted painlessly under the skin to monitor various health conditions. She had worked with her peers and research professors to improve SecondSkin, the wound-healing prosthetic epidermis developed to dramatically reduce healing time for diabetics.

With her experience in both research and augmented intelligence, Camila entered Career Fair with high hopes.

*"We need to understand fundamental biological pathways. Can we understand enough of [the fundamentals] to solve problems? We're at the baby steps. I think and I hope our curriculum will shift from rote memorization to hands-on problem solving. We may (create) a custom curriculum (for each student). Rather than looking at skills and knowledge linearly, students will specialize instead. As technology outpaces the way we teach, our teaching is going to have to catch up. There are already a huge number of students in this department that are heavily involved in undergraduate research. I have had about 65 undergrads work in my lab, so they can learn this is how science is really done. What we all need to keep in mind is that we're doing the best we can with our skills and knowledge now. It's a learning process. We need to be receptive to new information and ideas."*

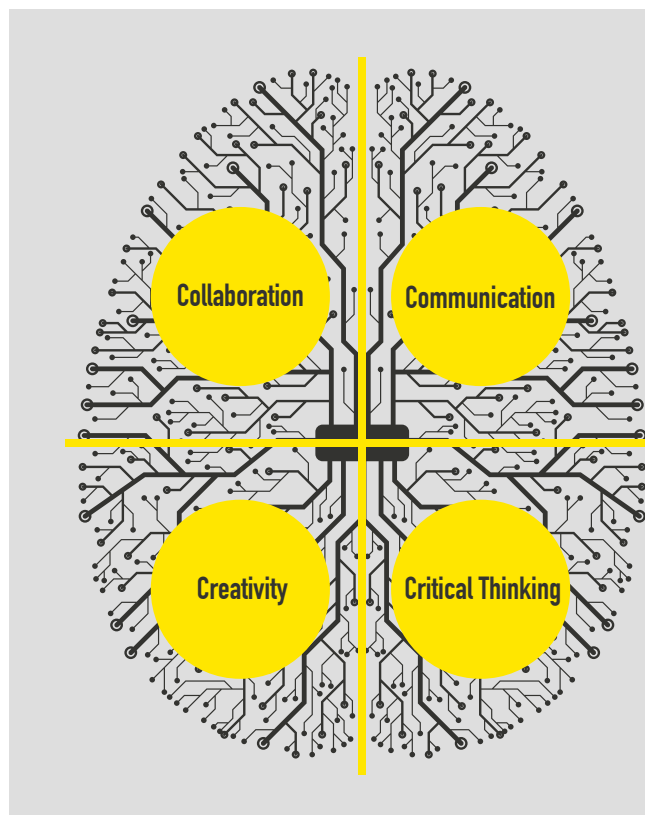
—Megan Frost, Associate Professor, Biomedical Engineering

"The machines are coming for the high-wage, high-skill jobs as well," warns Silicon Valley entrepreneur Martin Ford in his book *Rise of the Robots: Technology and the Threat of a Jobless Future*. Indeed, for at least a decade, thought leaders have been grappling with the possibility of a world in which robots are doing many of the jobs humans perform today.

Can Michigan Tech graduate a class of 2045 that's automation proof?

The answer is a qualified yes—if not automation proof, then definitely automation resistant.

In December 2016, the Executive Office of the President released a report entitled "Artificial Intelligence, Automation, and the Economy." Noting that artificial intelligence (AI) will likely change our notion of production and work in a fundamental way, the White House Council of Economic Advisors (CEA) predicted that jobs requiring manual dexterity, creativity, social interactions and intelligence, and general knowledge would thrive. The CEA identified four employment categories that might experience direct AI-driven growth in the future: engagement, development, supervision, and response to paradigm shifts.



## The Four Cs of 21st-Century Learning:

In 2002, a coalition of educators, policymakers, and business professionals formed a non-profit organization called the Partnership for 21st Century Learning (P21). P21 builds collaborative partnerships among business, community, education, and government leaders so that "all learners acquire the knowledge and skills they need to thrive in a world where change is constant and learning never stops." P21 identified the Four Cs of 21st Century Learning as critical to preparing students for the future. (p21.org)

# Artificial Intelligence, Automation, and the Economy



## ENGAGEMENT (OR AUGMENTED INTELLIGENCE)

Demands for labor will likely increase the most, the CEA predicted, in areas where humans “complement AI-automation technologies.” For instance, AI technology might improve detection of cancer or other diseases, but it can’t talk with patients about treatment options or guide them through treatment plans.



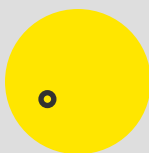
## DEVELOPMENT

“To a certain extent . . . AI is only as good as the data behind it,” the CEA said, “so there will likely be increased demand for jobs in generating, collecting, and managing relevant data to feed into AI training.” This shows the need for employees like Isaac, who have a background in social sciences or liberal arts. Social complexity and moral dilemmas require the knowledge of those who can, for example, conduct ethical evaluations.



## SUPERVISION

Everything related to monitoring, licensing, and repairing AI. Think autonomous vehicles. Humans will likely still need to register and test the cars to “ensure safety and quality controls on the road,” says the CEA.



## RESPONSE TO PARADIGM SHIFTS

The report describes how technological innovation surrounding AI could reshape features of our built environment. Think again of self-driving vehicles. Today’s traffic laws and infrastructure were designed with human drivers in mind. How will that change once computers are behind the wheel?

*“Having trained and worked with engineers, the best are the ones that can pull from the analytical and creative. Research is the search for knowledge. It happens on two levels. One, to understand the fundamental physics that’s there—the chemical processes, the biological reactions, all of it. There’s also the interactions beyond it, how it’s applied. The application of engineering knowledge will be so critical in 2045—with the sheer magnitude of human influence on this planet, we will either willingly or unwillingly be subjected to the laws of nature. That will depend heavily on whether we truly embrace a sustainability mindset.”*

—Adrienne Minerick '98, Associate Dean for Research and Innovation and Professor of Chemical Engineering

Like Camila, Isaac’s curriculum design included Enterprise. Student-connections officers in the Academic Innovation department introduced him to students from computer and electrical engineering, materials science and engineering, and natural resources management who were interested in improving microgrid technology and efficiency in poor, rural areas. They collaborated with students in India, whom Isaac had met through the connections he made his first year.

Mentored by Professor Abboud, the Advanced Microgrids Enterprise team spent a year in practice sessions before creating prototypes, the parts for many of which were printed on their personal 3-D printers. Their work addressed not only engineering and efficiency, but sustainability and policy issues. At the start of their junior year, Isaac and another team member participated in the Entrepreneur Incubator program in the School of Business and Economics, with the goal to launch a business by 2045.

**“Having trained and worked with engineers, the best ones are the ones that pull from the analytical and creative.”**

*“Sustainability is a key underpinning for leadership. I would hope sustainability is integrated into all disciplines in a much greater extent. We need to make better decisions about the technologies we develop. The solutions might look very different if we expand our view to include economic impacts, environmental impacts, and societal impacts. Why waste money on something that won’t benefit people in the end?”*

— David Shonnard, Professor of Chemical Engineering and Richard and Bonnie Robbins Chair in Sustainable Use of Materials

Sustainability. In simple terms, it’s the ability to maintain something at a certain rate or level. According to the UN World Commission on Environment and Development, sustainable development is



“development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” For sustainable development to be achieved, the Commission says, it will be critical to build on three pillars: economic growth, social inclusion, and environmental protection.

On a May morning in 2045, Camila Romero and Isaac Matthews stand among the members of Michigan Tech’s graduating class. Camila smiles at her best friend and tells him to fix his slightly askew mortarboard, but he shrugs his shoulders and makes a joke instead.

headed for a research position at a national lab outside Washington, DC. Her work as a research assistant had paid off—she had been hired to research wearable gene therapy devices for infants with congenital heart defects.

Camila and Isaac came to Michigan Tech because they believe in the power of science, technology, engineering, the arts, and math to solve complex problems when applied in tandem. They believe in thoughtful introduction of technologies that support, rather than hinder, human productivity and job growth. They believe in scaling up technologies to aid people in the developing world. Sustainability is core to their experience, and conducting life-cycle analysis of technologies to determine the effects on the environment and society are integrated into the work they do.

From inside the arena comes the sound of the processional music, signaling to the waiting students that the time has come to receive their degrees. Isaac and Camila smile at each other, a little nervous, but mostly jubilant. Their futures—and our planet’s future—are waiting.

The United Nations: Effective January 1, 2016

## 17 Sustainable Development Goals



1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation, and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below the water
15. Life on land
16. Peace, justice, and strong institutions
17. Partnerships for the goals

*“When I first came here, I came from a large, well-known research university that prided itself on doing fundamental research.*

*The types of problems we solved were often esoteric. We developed elegant solutions to those problems, but the likelihood those solutions would be implemented in our lifetimes was small. At Michigan Tech, what struck me when I first arrived was that the people here were creating solutions to real problems that could be implemented almost immediately.”*

—Jacqueline Huntoon,  
Provost and Vice President  
for Academic Affairs

*“Eh. I run my own business now. I can do what I want.”*

**“At Michigan Tech, what struck me when I first arrived was that the people here were creating solutions to real problems that could be implemented almost immediately.”**

Camila laughs. For a moment, she allows herself to get lost in a memory of her first week on campus at Michigan Tech. She smiles nostalgically when she remembers meeting Isaac, who like her had chosen to attend Michigan Tech because of the University’s focus on integrated sustainability and socially aware research.

Now he was starting his own business with collaborators around the world, and she was



# TRAVELING THROUGH TIME— DIGITALLY

The Keweenaw Time Traveler takes people for a ride through the peninsula's history, and encourages them to add their own stories, too.





## Have you ever wondered who lived in your house before you? Not the people you bought it from, but the people who built it more than 100 years ago? Were they Finnish or German or Cornish? Did they work for the mine, or were they shopkeepers?

What did people do during winter of 1978, when 355 inches of snow fell, and the roads were snowed in for days at a time?

Did the mine bosses like your great-great-grandfather, or did they think he was a bit too ornery?

The Keweenaw Time Traveler enables us to answer these questions, to travel through time, and to explore the Keweenaw Peninsula with the click of a mouse.

### A Digital Time Machine

The Keweenaw Time Traveler (its official name is the Copper Country Historical Spatial Data Infrastructure) is an online, map-based application that uses maps, historical documents, US Census data, and personal narratives to create a database about the changes that the natural, social, industrial, and built environments have undergone from 1850 to present. Using participatory Geographic Information Systems (GIS), the project builds a historical record of the Copper Country that is interactive and constantly evolving.

The project is supported in part by a three-year, \$259,882 grant from the National Endowment for the Humanities. But ongoing participation comes from community members interacting with the Time Traveler.

Community participation in telling the story of the Keweenaw has shaped the project from the very beginning. Don Lafreniere, assistant professor of geography and GIS, and Sarah Fayen

Scarlett, assistant professor of history, conducted a series of design charrettes around the community to test beta versions of the Time Traveler's builder apps, the participatory GIS interfaces that allow people to input information into the Time Traveler.

Robert Pastel, associate professor of computer science and affiliated associate professor of cognitive and learning sciences, collaborates on the project with Lafreniere and Scarlett. Lafreniere notes that Pastel's students assisted with the project by testing the Time Traveler in various computer science courses. Those students also helped during meetings with community groups to improve the app's interactive design.



**“Just like sitting around the coffee shop talking about old times, we’re providing a way for people to do that in a digital space,” says Don Lafreniere, assistant professor of geography and GIS, and director of the Historical Environments Spatial Analytics Lab and the Geospatial Research Core Facility.**



## What the Time Traveler Means to the Keweenaw National Historic Park

“The Time Traveler is a great way to connect students with community and to build viable GIS skills.”

—Wendy Davis  
Superintendent,  
Keweenaw National  
Historic Park



Currently there are four ways people can add information. The document-building-materials-app inserts information about a construction material a building is made from—brick, wood, stone, etc.—while the document-building-use app inserts information about how buildings have been used through time. The transcribing-maps app allows users to transcribe handwritten notes on old maps computer algorithms can't read. The explore app allows people to view the historical data on the map while also contributing information at the same time. Eventually, the explore app will be the primary way to input data into the Time Traveler.

To prevent inaccurate data—to err is human, after all—the apps use a consensus model that requires three people to agree on a particular data point before the information is added to the system. With the transcription component, the program runs an algorithm and parses the text to see if someone typed in the same or similar text.

"We want to make it fun for people so that while they are helping to build the Keweenaw Time Traveler, they're having a good time, and come back and interact with it in different kinds of ways. We're trying to figure out how to make it the most fun for the most people," Scarlett says.

Through beta testing, the researchers discovered different age groups seem to prefer interacting with the Time Traveler in different ways. Younger people seem to prefer a game-like environment, in which inserting information comes from specific tasks prompted by the program. Other people prefer to navigate to places of their choosing to add data.

"We say, 'Where do you live? What's your favorite place in the Keweenaw?'

Let's find it.' We can then zoom in to a familiar place," Scarlett says. "People have a better experience when they feel oriented with the maps to a place that they know. When they get to a place

**"We're characterizing the app as a place where people can talk about old times—people who are here can do that with people who are not here," says Sarah Fayen Scarlett, assistant professor of history. "There are so many people throughout the country and even farther afield who have ties to the Keweenaw who aren't necessarily here. There's a lot of memory out there."**

or building that's familiar, we can show them how to look at that building with maps from different years, to see how it's changed through time."

### **Stories of the Keweenaw—From Anywhere in the World**

Scarlett and Lafreniere emphasize that the Time Traveler allows people who have connections to the Keweenaw but live elsewhere to enter the discussion about area history and contribute their stories.

Keweenaw Time Traveler isn't meant to only record what happened 100 years ago. The researchers say that while they have a bevy of historical information, they also encourage people to enter their personal stories from their lifetimes, whether from last year or decades ago. Use the explore app to enter a memory about a specific place and upload up to three images, whether photos or files.

In the future, Lafreniere and Scarlett plan to do themed calls for data input, such

as one that focuses on memories from the winter of 1978–79, or a call to alumni to contribute favorite memories from their college years in specific buildings on campus.

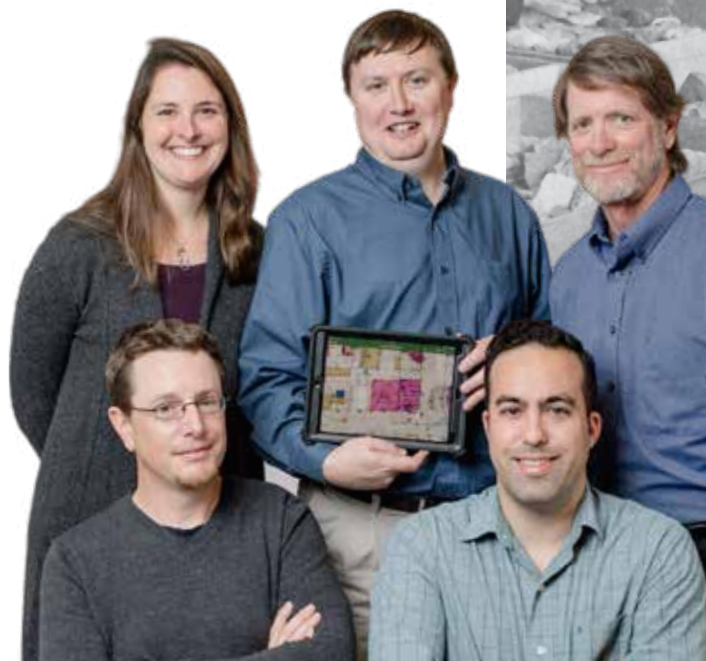
"I think it'd be fun to do one in the depths of winter this year around Winter Carnival," Lafreniere says. "What if we did one about the hockey championship from last winter? We want to really emphasize this doesn't have to only be about really old stuff."

### **Just the Beginning**

History is made every day; each of us participates in the construction of our community's history. The Time Traveler is another way to contribute to the historical record of the Keweenaw Peninsula.

"This is the very beginning. We are just getting data in," Scarlett says. "This is intended to have a long life and to keep growing dramatically and in ways people want to see it happen. We want it to be a tool that people in the community can use to record what they think is important. There are all kinds of opportunities—limitless."

Share your story about a favorite place on campus or in the Copper Country. [Visit keweenawhistory.com and start the Time Traveler.](http://www.keweenawhistory.com)





## Traveling Through Time with the Continental Fire Hall



**1883:** Constructed for the Houghton Fire Company

**1885:** First classes of the Michigan Mining School held on the second floor

**1880s:** Houghton municipal offices on the second floor, two story brick addition on the north side for more hay and horses



**1916:** One-story brick addition added on the western side



**1974:** Fire Department moved to current location on Sharon Avenue; OK Auto Supply opened in the western wing



**1978:** Michigan Tech bought the building, used it for storage



**2010:** Sold to Jon Julien and partners to create a dance club



**2012:** Continental Fire Co. opened

(Timeline from the *Daily Mining Gazette* magazine published in 2012)





# GLENN MROZ: **LEVEL 5** **LEADERSHIP**



by Marty Richardson,  
former chair of the Michigan Technological University Board of Control







## Thank you, Glenn, for your leadership.

“During his 15 years of service as president, Dr. Mroz has ensured that Michigan Technological University remains a thriving university that provides an exceptional educational experience for Michigan’s next generation of innovators. Dr. Mroz understands Michigan Tech’s important role in the economic comeback of our state, as well as smart development

in northern Michigan’s rural communities. In addition to his academic leadership, I applaud Dr. Mroz for his commitment to regional initiatives, such as MTEC SmartZone’s collaborative deployment throughout the UP and promotion of STEM careers for Michiganders of all backgrounds. Thank you, Glenn, for your leadership.”

—Rick Snyder, Governor of Michigan

Sound like anybody we know? Yes, Glenn Mroz certainly has exhibited these characteristics as president, and shown exceptional results in the process.

During Glenn’s tenure as president, Michigan Tech reached record-breaking enrollment levels for undergraduate, graduate, and women students. The University expanded its research spending to more than \$72.5 million—the highest ever—and correspondingly increased the significance, value, and renown of its creative work. Under Glenn’s leadership, Michigan Tech has taken a prominent role as steward of a vital natural resource with the Great Lakes Research Institute—and it’s only fitting. As Glenn says, “After all, the Keweenaw Peninsula is right in the middle of Lake Superior—who better than Michigan Tech to lead Great Lakes research efforts.”

Bolstered by consistent marketing and branding programs, people know more about Michigan Tech than ever before, and are taking notice. Forbes says we’re one of the top 25 STEM (science, technology, engineering, and math) schools in the nation. Our endowment has doubled to more than \$106.4 million, and with Glenn’s guidance, we have achieved fiscal stability and eliminated accumulated debt.

But numbers alone don’t tell the complete story. The man behind the Office of the President has shown time and again that he “bleeds Husky blood.” There is no freshman who could demonstrate more enthusiasm at a hockey game—I’ve heard Glenn scream himself hoarse. My fellow board member and current board chair, Terry Woychowski, told me, “Glenn has an amazing and unwavering passion for his university and his students. At every commencement ceremony, we witnessed first-hand his heartfelt love for the students and mission of Michigan Tech.”

I have also witnessed Glenn’s connection and loyalty to students. He has an apparently unlimited capacity to care about each and every one. I sat beside him once at a board meeting as he gave a moving tribute to a recent ROTC grad who had just been killed while on military duty in Afghanistan; tears rolled down Glenn’s cheeks.

When people consider transformative, effective leadership, they often think of larger-than-life, egocentric personalities like a Lee Iacocca or a Jack Welch. During my eight-year term on Michigan Technological University’s Board of Control (now the Board of Trustees), I came to understand that the most effective person in Michigan Tech’s presidential chair is, rather, an executive with personal humility and intense professional will.

Leadership guru Jim Collins specified a Level 5 leader—the ultimate level of leadership—to have certain characteristics:

- Does not rely on charisma
- Shy yet fearless, with ferocious resolve
- A blend of genuine personal humility with intense professional will
- Surrounded by the right people
- Looks in the mirror when assessing blame, but out the window when apportioning credit
- Asks more than tells
- Doesn’t talk about self, but about the organization and especially the contribution of others
- Shuns public adulation, is never boastful
- Sets up successors for even more greatness in the next generation





I've heard him vehemently refuse a salary increase because he felt that the faculty deserved it more.

He also has a deep connection to alumni. Terry Woychowski said he always appreciated when Glenn "would travel to southeastern Michigan and meet with alumni engineers at General Motors to deliver a State of the University address. It helped keep our associates connected and involved. When it came time to field a recruitment team to travel to Houghton," Terry continued, "we never had a problem. Just the opposite—we would need to turn people away."

Indeed, Michigan Tech's career fairs continue to be regularly oversubscribed. Thanks to Glenn's leadership, the University has established a Career Fest to accommodate even more employers.

The role of president is all consuming; year after year, Glenn has never really been "off duty." And during that time, his wife Gail

has been standing right beside him, as supportive of Michigan Tech as she is of her spouse. The two of them have made an unbeatable Husky duo, and the University is better because of their significant contributions. I know the extended Michigan Tech community wishes them the very best as they return to faculty life here at the University.



**Martha (Marty) Kresnak Richardson '79** joined the Michigan Technological University Board of Control (now the Board of Trustees) in 2005 and served as its chair from 2010 to 2012. Richardson and her husband, Jerry, are generous supporters of Michigan Tech and are enjoying retirement on their fifty-two-foot trawler, *Monarch*.

## More Highlights from the Mroz Years

- ▶ During President Mroz's tenure, Michigan Tech has conferred 19,637 degrees (and that number will be more than 20,000 by the time he steps down). Since 1885, Michigan Tech has conferred a total of 73,116 degrees. That means in 13 short years, the Mroz administration has produced 27 percent of all conferred degrees in the University's 132-year history. For PhDs specifically, 874 out of 1,495 have been conferred during the Mroz years—that's 58 percent.
- ▶ Since 2005, the average ACT composite score for incoming first-year students has risen from 25.1 to 27.2, while the national average has remained flat at 21.1.
- ▶ Renewed focus on faculty hiring increased tenure and tenure-track faculty from 295 to 340. Much of this was accelerated by the Strategic Faculty Hiring Initiative (SFHI) that targeted faculty hires to address university, state, and national priorities around sustainability, energy, health, computing, and materials.
- ▶ The University purchased the Environmental and Emerging Technologies Division of the Altarum Institute and reorganized it as the Michigan Tech Research Institute (MTRI), giving us a downstate presence in Ann Arbor. MTRI, which recently celebrated its tenth anniversary, started with 24 employees and now has close to 60.
- ▶ During Mroz's time as president, Michigan Tech has incubated between two and four start-up companies per year.
- ▶ The University completed its second major capital campaign, raising \$215 million, 108 percent of the original goal. From 2004 to date, Michigan Tech raised \$364.66 million in philanthropic support.
- ▶ Michigan Tech hockey has returned to prominence, winning the WCHA in both 2016 and 2017.



## LARRY STAMBECK JR.

woke to sudden, sharp pain on a September morning in 2016. He shifted around on his extra-large twin bed in East McNair Hall. Ouch. Maybe he had slept funny. Maybe he pulled something. Maybe it would go away on its own? I'll give it a few days, he decided.

A week went by. The pain persisted.

He felt a couple of lumps, too. The sophomore studying electrical engineering technology Googled his symptoms. Cancer, as it's known to do, crept to the top of the list.

Larry shrugged it off. Humor helped him express concerns tucked beneath the surface. "I told a few friends about what was going on, what I was experiencing. I remember joking, 'I probably have cancer, haha!'"

Fall classes had just started. He didn't want anyone back home in Paw Paw, Michigan, to worry about him, especially not his mother, Cynthia Henderson, who was a 10-hour drive away.

# TENACITY KNOWS NO BOUNDS:

**BEATING TESTICULAR CANCER WITH HELP FROM HUSKIES**



## EVENTUALLY LARRY SCHEDULED AN APPOINTMENT TO SEE A DOCTOR.

Blood work, x-rays, a CT scan. Swift action from a team of up-north healthcare providers. All jokes aside, Larry, 20, had cancer. Testicular cancer.

And he had to call his mom.

## THE CALL NO ONE WANTS TO GET

"My instinct was to get him home, to care for him down here," Cynthia recalls. "I felt stuck." But Larry was vehement he'd be staying on campus, staying in school, and seeking treatment at Aspirus Keweenaw in Calumet.

"Everyone I encountered—my urologist, my oncologist, my nurses—was kind, professional, and understanding. I didn't want to leave my friends. I didn't want to fall behind. I wanted to keep my studies going—I love it in Houghton," Larry says.

Huskies are known for keeping rigorous schedules. Larry's load quickly became even more full: Diagnosed September 28. Surgery to remove cancerous testicle October 14. Surgery to place chemo port November 18. Weeks of chemo began November 28. "Everything was lined up, planned, and ready to go," he says.

Between surgeries (the chemo port was finally removed in February), appointments, and treatment, there were the holidays, too. For Larry, that meant more traveling to and from campus. "He had surgery on a Friday and drove 500 miles the next day," his mom says.

Navigating four classes, cancer, and chemo was grueling Larry recalls. "Appointments and tests every other day. Chemo made me feel sick and sometimes irritable. It felt overwhelming at times." Eventually, and at the urging of Erica Denofre '98, a civil engineer turned registered nurse in Aspirus Keweenaw's Outpatient Infusion Department, Larry dropped two of his most challenging classes.

**HE'S STILL REGAINING ENERGY CHEMO STOLE AWAY. HE HESITATES, THEN LAUGHS, AS HE SUMMARIZES THAT CRAZY, CHALLENGING SEMESTER: "ONE MAN. ONE NUT. ONE MISSION."**



## HUSKIES STICK TOGETHER

In his home-away-from-home, surrounded by a close-knit second family, Larry got through it, and beat cancer. "I'd come back to the dorms after chemo and crash. I was too weak to make it to the dining hall. Friends helped grab me lunch and dinner, or something to drink. They drove me to and from appointments. They rallied around me and stepped up to do anything I needed."

Cynthia adds: "Just imagine a bunch of college kids dealing with testicular cancer. They gave him funny notes to cheer him up. Cheeto balls. Peanuts. They kept his spirits up, and as his mom, that meant everything to me."

As the one-year anniversary of his diagnosis approaches, Larry's working 10-hour days at a door engineering company and gearing up for another semester.

"It's sort of an inside joke between me and my friends."

"These kids are a family. They are kind, considerate, polite, funny, and mature. They are more than roommates. More than

party buddies. Maybe it's because they all are so far away from home?" Cynthia wonders.

Through cancer, Larry learned a little about himself, too: "I'm tougher than I ever knew, and there's no challenge or setback I can't handle."

**LARRY'S ONCOLOGIST SAYS WAITING OR DELAYING TREATMENT COULD HAVE KILLED HIM.**

**"HE SAVED HIS OWN LIFE," SAYS DR. ZUHAIR GHANEM.**

## THE FACTS ABOUT TESTICULAR CANCER:

- Most commonly affects males between the ages of 15 and 35
- Usually presents as a nodule or painless swelling of one testicle
- One of the most curable solid neoplasms with a five-year survival rate of more than 95 percent

**“TESTICULAR CANCER AFFECTS YOUNG MALES WHO TYPICALLY LEAD AN ACTIVE LIFESTYLE.”**



Hear more from Larry, his mom, and a few of his friends. Visit [mtu.edu/magazine/tenacity](http://mtu.edu/magazine/tenacity).



**David Shonnard**  
*Sustainable Futures Institute*  
Portage Canal Lift Bridge



Start seeing double. That's what researchers at the Sustainable Futures Institute do. Because not everything is as it appears: deadly gases lay trapped beneath lake waters; mountains of manure release more than smells; coffee pots, whiteboards, pencils, paper cost more than their price tags.

In each of these cases, engineers studying a product's sustainability have to see more than a landscape, trash heap, or everyday object. They see the complex interactions that build up a product's whole life from cradle to grave; they call measuring those relationships and impacts a life cycle assessment, often shorthanded to LCA.

While LCAs are a common and widely used technique throughout many engineering fields, it takes a specific frame of mind to apply it to sustainability. David Shonnard is the director of the Sustainable Futures Institute and oversees two programs for students to earn an undergraduate or a graduate certificate in sustainability. He summarizes the mindset like this: "Typically, when an engineer has a complex problem, they break it into smaller problems."

# Two- fold

when an engineer  
has a complex  
problem,  
they break it into  
smaller problems

**E**ach fall, Shonnard offers ENG/SS 5510, Sustainable Futures I, a cross-listed class where undergraduates and graduate students learn the basics of LCA methodologies and the Sima Pro software used for analyses, then apply the lessons to a term project focusing on a product that they select. Some students choose a tool related to their field, others look around the classroom or their homes for inspiration—like comparing the impacts of drip coffee versus single-cup machines or smartboards versus regular whiteboards. But Sam Fentress '16 looked abroad and went big.

Lake Kivu is a large volcanic lake bordering the Democratic Republic of Congo and Rwanda in Africa. The waters are highly stratified with thick layers of carbon dioxide and methane resting at the lake bottom. More than a geologic anomaly, the heavy gases are a danger: in 1986, Lake Nyos, another volcanic lake in Cameroon, turned over and exploded in what is called a limnic eruption, releasing hundreds of thousands of tons of heavy gases that overwhelmed nearby villages and suffocated nearly 2,000 people.

Because of the similar stratification of Lake Kivu, natural disaster experts have worried about the threat of a limnic eruption and its impacts on the two million people living on its shores.

Fentress happened to be studying Lake Kivu in a geological hazards and mitigation class at the same time she was enrolled in Shonnard's Sustainable Future I course. When she found out that a specialized power plant in Rwanda drew energy by converting the lake's methane into electricity, Fentress saw an opportunity to compare the release of greenhouse gases from a limnic eruption versus methane extraction for power production.

"I felt like an explorer," Fentress says, explaining that she sees STEM research as the opportunity to delve into new, creative ideas and put some data behind them that make a difference in people's lives. "Methane extraction from Lake Kivu mitigates the hazard of a violent limnic eruption, provides electricity to Rwandans, and substantially decreases the greenhouse gas emission burden on the atmosphere."

## I felt like an explorer

**Samantha Fentress**  
GMES Alumna '16  
Lake Kivu, Rwanda







**Sharath Ankathi**  
*PhD Student*  
Heartland Biogas Facility



**M**ethane is also 25 times more effective as a greenhouse gas than carbon dioxide and is the same gas that Sharath Ankathi examined halfway across the world in a Colorado dump. Large cattle operations are common along the front range and so are piles of manure. The Environmental Protection Agency reports that agriculture emissions account for nine percent of United States greenhouse gas emissions each year; municipal solid waste accounts for less but between 30 to 40 percent of the country's food supply gets trashed and 97 percent gets buried in landfills, which decomposes and off-gases as methane.

Ankathi and Shonnard see that as a waste—not only of food but of energy. Anaerobic digesters convert methane into a usable energy source, which Ankathi and Shonnard have put some numbers to in a new paper published in *Environmental Progress & Sustainable*

*Energy* and showed in a case study at the Heartland Biogas LLC outside Denver, Colorado. Whether a biogas facility or a home coffee pot or a natural hazard, Shonnard says the power of LCAs lies in the ability to scale up.

"The methods apply to many types of manufacturing, and even other activities like the service economy," Shonnard says. "With any kind of human activity, you can apply an LCA."

By putting their LCA expertise to use in so many different challenges, the Sustainable Futures Institute reveals the deeper stories of vistas, waste, and common items, showing their intricate connections with people and the rest of the world.

To learn more about the Sustainable Futures Institute, visit [sfi.mtu.edu](http://sfi.mtu.edu).

**30 to 40  
percent of  
the country's  
food supply  
gets trashed  
and 97 percent  
gets buried in  
landfills**





Joe Shawhan is a 20-year veteran of hockey coaching, with more than 10 years in college and 10 years in junior hockey.

## Alumni Engagement

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### Hockey talk with Head Coach Joe Shawhan

Two things can be said of Michigan Tech men's ice hockey coach Joe Shawhan: he knows hockey, and he's a Yooper through and through.

On May 30, Joe Shawhan became the 22nd head coach in the storied history of Michigan Tech hockey. He spent the previous three seasons as an assistant for Mel Pearson.

A native of Sault Ste. Marie in the far eastern Upper Peninsula, Shawhan has coached for all three UP NCAA Division I hockey programs—Lake Superior State, Northern Michigan, and Michigan Tech. As a junior hockey coach, he led the Soo Indians to a 475-162-8 record in 10 seasons to become the winningest coach in North American Hockey League history.

During his three years as an assistant at Tech, working primarily with goaltenders and defensemen, the Huskies went 75-34-14, with two NCAA appearances, a Western Collegiate Hockey Association (WCHA) title, and a WCHA tournament championship. The Huskies were ranked second in the WCHA and in the top 10 nationally in goals against average all three years. Goalies Jamie Phillips and Angus Redmond flourished under Shawhan, breaking Tech records. Both have signed with the NHL.

As Michigan Tech Vice President for Student Affairs and Advancement Les Cook said at the press conference announcing Shawhan as head coach, "Winning seems to follow Joe wherever he goes."



**Q: First off, congratulations. This coaching vacancy created a lot of interest in hockey circles. What makes the head coach of Michigan Tech such a desirable position?**

A: It's a Division I head coaching position, and that's always going to attract interest. But it's more than that. The excitement in [the UP] for the game of hockey and the tradition and commitment from the University make it a special place. The talent pool of candidates for the job was very high, maybe the best of any of the coaching vacancies that occurred this off-season. I am blessed to have been selected.

**Q: You're the first new Huskies head coach in 35 years to replace a coach with a winning record, so you aren't tasked with "rebuilding" a program. Do you feel there's added pressure to take the program to the next level?**

A: Pressure is internal. I try not to look at it in those terms. I know where we stand—our strengths and weaknesses both collectively and individually. What we've lost in the off-season and what we've gained. We have a long way to go, a lot of new faces in key positions. My job is to teach in a way that we get a little better every day.

**Q: What can Huskies fans expect Husky Hockey to look like under Coach Shawhan?**

A: Hopefully the same. We play the game the way I like the game played. We skate, we compete, we swarm. I was not hired to change Husky Hockey. I was hired to continue the trend. The staff we put in place was selected because they share the same philosophies. Different tactics and wrinkles, but the same philosophy.

**Q: You're known for your expertise in defense and goaltending. Do you agree with the well-worn notion that "defense wins championships"?**

A: Players win championships. People win championships. Defense and goaltending are a big part of it, but commitment to a common goal, team chemistry, and self-sacrifice are equally if not more important. There are no short cuts, no chance of reaching your best level of performance without leadership that has a deep-rooted foundation of accountability.

**Q: Taking a look at your team, what do you feel are the strengths and where do you hope to improve?**

A: The strength of Michigan Tech hockey is the character of the players sitting in the stalls. Going in, we're most experienced at the forward position. That's no secret, but there are no guarantees. We have to show up prepared mentally and physically to make strides. The best chance a team has of success is with individuals that expect it and work hard toward it. Every day. All the time. We have those types of individuals.

**Q: You're from Sault Ste. Marie and have coached at all three UP Division I hockey programs. Obviously, you feel the UP is a great place to live and raise a family. But, what is it that makes UP hockey so special?**

A: That's a hard question. I know that people in the UP, in the areas I've lived, almost treat hockey as a religion. What makes the UP special is the people. I love the region. I would have been fine if I could have made my living fishing or hunting or camping or boating or riding a sled. What I do is not a job. Honestly, I hope I never wake up from my dream. I'm thankful I don't have to get a real job.

**Favorite place in the UP:**

My camp in Barbeau  
(about 17 miles south of the Soo)

**Favorite UP food:**

Fry bread tacos, with nods to pasties, pickled eggs, and the Big C cheeseburger at Clyde's Drive-in (Sault Ste. Marie)

**Favorite place to watch a hockey game:**

The John J. MacInnes Ice Arena, by far.  
Great environment.

**Favorite NHL team growing up:**

Montreal Canadiens/Detroit Red Wings

**Favorite NHL player growing up:**

Tony Esposito  
(Montreal Canadiens, Michigan Tech)

**Biggest career influence:**

Jeff Jackson (former head coach at LSSU,  
now at Notre Dame)

**Favorite sport (other than hockey):**

NFL football

**Favorite (non-sport) TV show:**

*Game of Thrones*

**Guilty Pleasure:**

Banana splits





# MY COUSIN MY BROTHER



**In India, it's pretty rare to encounter someone with the same surname.**  
—Prannay



**Harsh and Prannay Malu**

Last fall, mechanical engineering major Harsh Malu felt like any first-year Michigan Tech student—a little nervous. Huskies travel far and wide to get to campus, and Harsh was moving 8,000 miles from his home of about three million people in Sangli, India, to Houghton, Michigan—population 12,000.

"I was looking for a peaceful place to study away from the hustle and bustle," Harsh says.

Anxiety hovered as Harsh wondered if he could or would make any friends.

"There's an active Indian community on campus, but just because I might look like another student doesn't mean I know them or am friends with them."

Harsh's trepidation eased when he attended a ceremony for Lord Ganesha (god of wisdom and learning and remover of obstacles) hosted by the Indian Students Association (ISA).

"A new friend let me know there was someone at the ceremony with the same last name as me, and that I had to meet him," Harsh says.

That someone was Prannay Malu '17, then an electrical engineering master's student. "It's an

unbelievable thing, really. In India, it's pretty rare to encounter someone with the same surname," Prannay explains.

Harsh phoned home after the gathering. "I asked my granny if we had any cousins who aren't in

the city anymore. And she said, 'Go on . . .' She told me how Prannay's family migrated from our city to

Nishik, India, about 30 years ago. "That made me and Prannay cousins! My family and close friends back home could not believe it!"

## A Brotherly Bond

As the school year marched on, the fourth cousins became more like brothers. "Harsh is like my younger brother, and I feel responsible for him. I love being a big brother—making sure he's comfortable, helping him," Prannay says.

"Prannay is who I call at 2 AM," Harsh says. "He's who will cook for me, anytime day or night. He wants good things for me. I remember one day he called me and asked what I was doing. He told me to drop everything, put on formals, and come to the ISA general elections. He encouraged me to run for the fundraising chairperson position. I took his advice, and now I'm the chair. I'm so grateful for his encouragement."

Prannay has since graduated and is working with Astute Engineering LLC, a Metro DC-area startup.

"I miss the safety and security of Houghton. I'm from a small town of about two million people back home in India; Houghton changed my definition of small. Everyone was so kind and caring, always looking out for one another."

"Huskies struggle together, because in the end, we all want good jobs," Prannay says. "I'm no longer on campus, but want the best for Harsh. There will be hardships and challenges—it will make him a better person, a better human."

Back in India, Harsh and Prannay were 10 hours apart in a country with more than a billion people. Would they have ever met? "No, I don't think so," Harsh says. "It happened because of Michigan Tech—and it's a miracle."

Do you have a crazy, only-at-Tech connection? Tell us—  
**social@mtu.edu.**





# REUNION RECAP

40 stuffed mascots. Nearly 400 pasties.  
And more than 40 Golden M inductees.

A record 677 alumni and friends attended Reunion 2017 to honor our past, see what's new, and find out what awaits.

This year's featured classes—2007, 1997, 1992, 1987, 1977, 1967, and 1957—raised \$876,146 in class gifts, and \$4,000 was raised during a silent auction for the Women of Michigan Tech scholarship fund.







## GIVING BACK. SERVING OTHERS. CREATING THE FUTURE.

Eight individuals were recognized by the Michigan Technological University Alumni Board of Directors at its annual Alumni Dinner and Awards Ceremony during this year's Alumni Reunion. President Glenn Mroz presented the Michigan Technological University Board of Control Silver Medal to John L. Drake '64 '69 and Norbert J. Verville Sr. '60. These alumni and friends also were honored for their achievements: Outstanding Young Alumnus Kevin C. Baker '04 '05; Honorary Alumnus John C. Dau; Outstanding Service Paul H. Mikkola '66; Distinguished Alumnus John J. Rockwell '79; Humanitarian Sanna B. Roling '67 and Nicholas H. Schreiner '11.



The cool mist of Hungarian Falls. Sunsets atop Brockway Mountain. Skiing powder on Mont Ripley. Late nights playing broomball.

What's on your #HuskyBucketList? Add your must-dos to the Alumni and Friends Bucket List by the decades! Share memories and photos for your bucket list at [mtu.edu/alumni/favorites/bucketlist/decades](http://mtu.edu/alumni/favorites/bucketlist/decades).

And visit [mtu.edu/bucketlist](http://mtu.edu/bucketlist) for a checklist of 85 Michigan Tech traditions, Keweenaw favorites, and what it means to be a Husky.

## SAVE THE DATE!

Make plans to join us for Alumni Reunion 2018, August 2-4.

The featured classes will be the Golden M's (Class of 1968) as well as the classes of 1958, 1978, 1988, 1993, 1998, and 2008.





## TECH ALUMNA DESIGNS LITTLEST DIAPER



Angela Johnston works for one of the largest consumer products companies, and she's developed a product to help the smallest human beings.

The Michigan Technological University chemical engineering alumna developed, tested, verified, and commercialized a new diaper designed especially for premature babies.

"As a scientist and a mother, it is something I'm proud to be a part of," she says.

Solving problems is what Johnston, a 2000 Michigan Tech graduate, does every day in her role as product

technical leader for Huggies®

Little Snugglers at Kimberly-Clark Corporation. She's worked with hospitals and neonatal intensive care units to design the best diaper for preemies.

Her path to Kimberly-Clark started at Michigan Tech, where she followed in the footsteps of her older sister, Maria Thielbar, a 1997 chemical engineering graduate. She credits Tech's impressive job placement rate and a University Board of Control Scholarship for helping her earn her degree.

Michigan Tech teaches you how to think, Johnston says.

"Like many teenagers, I didn't know what chemical engineers did," she says. "Chemical engineers think about a situation or problem from multiple angles, are creative, and unafraid of working hard to come up with solutions."

In her 17 years at Kimberly-Clark, Johnston has traveled across the globe, seen products she's developed on store shelves, and accepted Product of the Year Awards for Kimberly-Clark in Times Square.

"I really love what I do," she says. "Being a champion for the target consumer means I put myself in someone else's shoes and imagine better solutions."

Johnston met her husband, Jim, when he was also studying chemical engineering at Michigan Tech. The couple lives in New London, Wisconsin, with their daughters Jane, 11, and Kate, 10.

**Have you invented a product or gotten a patent? Send us your story: [alumni@mtu.edu](mailto:alumni@mtu.edu).**

## SUPPORTER. DONOR. HUSKIES FAN.



Jim Sarazin has donated to Michigan Tech every year for almost 40 years, and the last 20 of those years have been as a member of the President Club. And for nearly 40 years, he and his wife Linda, both avid hockey fans, have been season ticket holders to Michigan Tech hockey games.

Supporting Michigan Tech is just part of Sarazin's life.

His eyes were first opened to giving during a conversation with Bert Whitten, Sarazin's biology professor and advisor at Michigan Tech.

"He was starting a medical alumni scholarship and asked me to donate," Sarazin recalls. And so began a lifetime of giving to Michigan Tech.

"A moderate amount of giving over time makes a difference," he says.

Sarazin is the fourth generation in his family to live in the Keweenaw. His great-grandfather traversed Canada to settle in the Bootjack area in the 1800s. There the Sarazin family built what is now Dreamland Restaurant and Bar. Two of Sarazin's siblings operate the establishment today.

Sarazin is a dentist in Hancock, serving the community for nearly 42 years. He and Linda have been married for 45 years. Their son, Tyler '07, is also a dentist, working alongside his dad at their practice, Sarazin Dental on Quincy Street. Son Ryan is a history teacher and hockey coach in Fond du Lac, Wisconsin. The couple enjoy spending time with their three grandchildren.

After graduating from Lake Linden High School with Linda, Sarazin enrolled in pre-medicine at Michigan Tech, taking the pre-med/pre-dental curriculum with an emphasis on chemistry and biology.

He attended dental school at the University of Michigan, returning to the Keweenaw to open his practice.

"I have a deep appreciation for the education I received at Michigan Tech," says Sarazin.

"Michigan Tech got me where I am today. It's part of me."

**To learn about ways your gift can support Michigan Tech, or to make an end-of-year gift, visit [mtu.edu/giving](http://mtu.edu/giving).**

# CLASS NOTES

Share your news! Post your class note and photo online at MyMichiganTech or email to [alumni@mtu.edu](mailto:alumni@mtu.edu). New addition in your family? Let us know. They will receive a special gift from Blizzard T. Husky.

## 1970s

**Frederic Wilson '71** (Geology) is enjoying his fifth decade at the US Geological Survey (USGS) in Alaska. He recently completed the first geologic map of Alaska in 35 years. It is a fully digital product, designed to be an analytical tool and a printed map. The publication of the map was announced on PBS News Hour and the production process featured in an article on The Conversation.com. He is now working on a geologic map of the Greater Antilles in the Caribbean.

**S. Randin (Randy) '72** (Mining Engineering) and Marylyn (Cuff) Sandrik are retired and live in Frisco, Texas. They have children living in Alabama (Stephen and Julie) and California (Sara), and their grandchildren are in Alabama.

**1** **Garey Johnson '72** (Electrical Engineering) wrote a book, *Golf and Marriage: Improve Your Marriage by Improving Your Golf*.

**2** **Rebecca Freund '77** (Biological Sciences) moved back to Houghton after a 40-year hiatus since graduating from Tech.

## 1980s

**Chris Adams '81** (Metallurgical Engineering) and wife, Carolyn, retired from Los Alamos National Laboratory after 23 years of service. They are building a home in Dexter, Michigan, and live in Plymouth, Michigan.

## 1990s

**3** **Don Bragg '92 '95** (Forestry), a US Forest Service Southern Research Station (SRS) research forester, has been named project leader for two research work units. He will assume leadership responsibilities for the work unit he is currently assigned to, the Southern Pine Ecology research work unit headquartered on the University of Arkansas campus in Monticello, Arkansas. Bragg will also serve as project leader for the Restoring and Managing Longleaf Pine Ecosystems research work unit. Bragg holds a doctorate in forest ecology from Utah State University. He is attending the US Forest Service's senior leadership program and will graduate in November.

**4** **Kathryn Remlinger '95** (Rhetoric and Technical Communication) published a book, *Yooper Talk: Dialect as Identity in Michigan's Upper Peninsula*, by the University of Wisconsin Press.

**Jennifer Jermalowicz-Jones '98** (Biological Sciences) received her PhD in Water Resource Studies from Michigan State University. She formed a lake restoration company in 2012 called Restorative Lake Sciences.

## 2000s

**Matthew Draper '01** (Mechanical Engineering) and wife, Kelly, welcomed their son, Archer Alexander, February 2016.

**5** **Katherine Kontio '02** (Applied Ecology and Environmental Science) and fiancé, Robert Coffelt, welcomed their first child, Paxton James, on May 14, 2017.

**6** **Benjamin Almquist '04** (Materials Science and Engineering) gave a talk at the 2017 World Economic Forum Annual Meeting of New Champions in Dalian, China, on the need to develop new disruptive therapies for healing diabetic foot ulcers and other chronic wounds.

**7** **Jessica (Kirkpatrick) Parrott '04** (Chemical Engineering) and John Parrott Jr. had a masquerade-themed wedding on January 16, 2016, at the Indiana Theater in Terre Haute, Indiana. Jessica has spent 13 years working for Marathon Petroleum and John has spent nine years working for Marathon Pipeline. The couple resides in Lawrenceville, Illinois. The couple proudly announces the birth of their daughter, Kennedy Grace, who was born March 2, 2017. Kennedy was welcomed home by half-brother, Silas Lee Parrott.

**Allison (Michels) Liddle '05** (Scientific and Technical Communication) is finishing up writing her first book, *Life Under Construction: Designing a Life that You Love!*. Liddle will travel with John Maxwell and his team to Paraguay in September, serving 10,000 business, youth and government entities to teach them about leadership. Her husband, Tony Liddle '05 (Business Administration), also owns a nationally awarded financial planning firm called Prosper Wealth Management ([prosperwealth.com](http://prosperwealth.com)).



## Class Notes

**9 Garrett Coffin '05** (Civil Engineering) and **Nicole (Carlson) Coffin '04** (Social Sciences) welcomed their little Husky, a daughter, Devin Rose, on April 29, 2017, in Plano, Texas.

**Ryan Smith '07** (Chemical Engineering) received his Professional Engineering License (Chemical) from the Texas Board of Professional Engineers on December 11, 2015. His son, Kyle Russell Smith, was born on March 23, 2015, and just turned two years old.

**Chris DeDene '09 '11** (Civil Engineering) and **Rita Lederle '11** (Civil Engineering) welcomed future Husky, Michael James, into their family November 2016. The family lives in St. Paul, Minnesota, where Chris is a pavement engineer at American Engineering Testing Inc. and Rita is a professor at the University of St. Thomas.

## 2010s

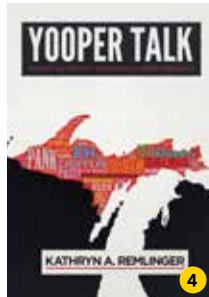
**10 Steve Schaezner '12** (Mechanical Engineering) and **Anna (Miller) Schaezner '12** (Mechanical Engineering) were married on April 22, 2017.

**11 Taylor (Driscoll) Giddings '15** (Mechanical Engineering Technology) and **Joseph Giddings '12 '15** (Marketing, Business Administration) were married in Detroit, Michigan, on June 24, 2017.

**12 Alanie Harmon '16** (Biomedical Engineering, Environmental Engineering) and Kaleb Sager announce the birth of their daughter, Aurora Adelaide, born on March 22, 2017.

**Thomas Witherspoon '13 '14** and his wife, Allycia, welcomed a son, Arliden (Arly) Thomas Witherspoon, on August 25, 2017. The couple met while students at Tech.

**Nan (Davis) Pond '12** and **Travis Pond '10** welcomed their first child, Cyrus James Houghton Pond, on September 8, 2017. The couple met as students at Tech.



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# IN MEMORIAM

**1941**

Glenford R. Huber  
Emil M. Szten

**1942**

Elmer J. Dupuis

**1947**

George M. North III

**1949**

Robert E. Campbell  
George A. Spratt  
Martin E. Stuk

**1950**

Elio Argentati  
Grant K. Cornell, PE,  
USAFR L/C  
Russell J. Osterman  
William D. Smith  
Clement M. Walker

**1951**

David S. Nancarrow  
Gayle D. Petrick, PE

**1952**

Hugh M. Vary

**1953**

Richard J. Braun

**1954**

Gilbert G. Gildner  
Clark A. Lebo

**1955**

Nicholas J. Eck

**1956**

Dale C. Anderson  
Kauko E. Leppanen  
Glenn A. Shockley

**1957**

Llewellyn W. Aho  
Donald R. Stevens  
Francis J. Stifter

**1958**

Vance D. MacDonald,  
MD

**1959**

Ronald J. Pasquinelli,  
PE  
Donald L. Richmond

**1960**

Howard E. Hanson  
Roger E. Heintz  
Lloyd D. Johnson  
Roy H. Miller  
Robert W. Stenfors  
Robert D. Wood

**1961**

Richard W. Lemke  
James J. Russo Jr.  
Sharon A. White

**1963**

Marlene B. Adams  
Richard D. Kay  
Samuel S. Ochodnický  
John D. Perry

**1964**

Robert W. Laakso  
David W. Pray

**1965**

Eugene E. Overmyer  
Jr.  
Duane L. Sarkela

**1966**

Robert C. Nelson  
John S. Voorhees

**1967**

John D. McDaniels Jr.

**1968**

William R. Steeb

**1970**

Dr. Hugh L. Hondorp  
Richard O. Swanson

**1971**

Warren B. Cummings  
H. Davis Kuhn

**1972**

Gerald R. Blondin  
Jeffry M. Vistain

**1974**

Lorraine A. Fowler  
Marinus L. Wouden

**1976**

Jack R. Cerasoli

**1979**

Roger R. Kolb  
Robert E. Niemela

**1980**

Steven J. Daavettila  
Richard J. Srnec

**1982**

Gul S. Goksel

**1984**

Larry R. Coke  
Robert J. Turnbull

**1988**

Pat D. Peterson

**1990**

Alan L. Mikovits

**1993**

Ray J. Ozols

**2007**

Jennifer L. Hafeli  
Julian M. Kevianne



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*-Rudy '62 '63 and Judy Shunta*

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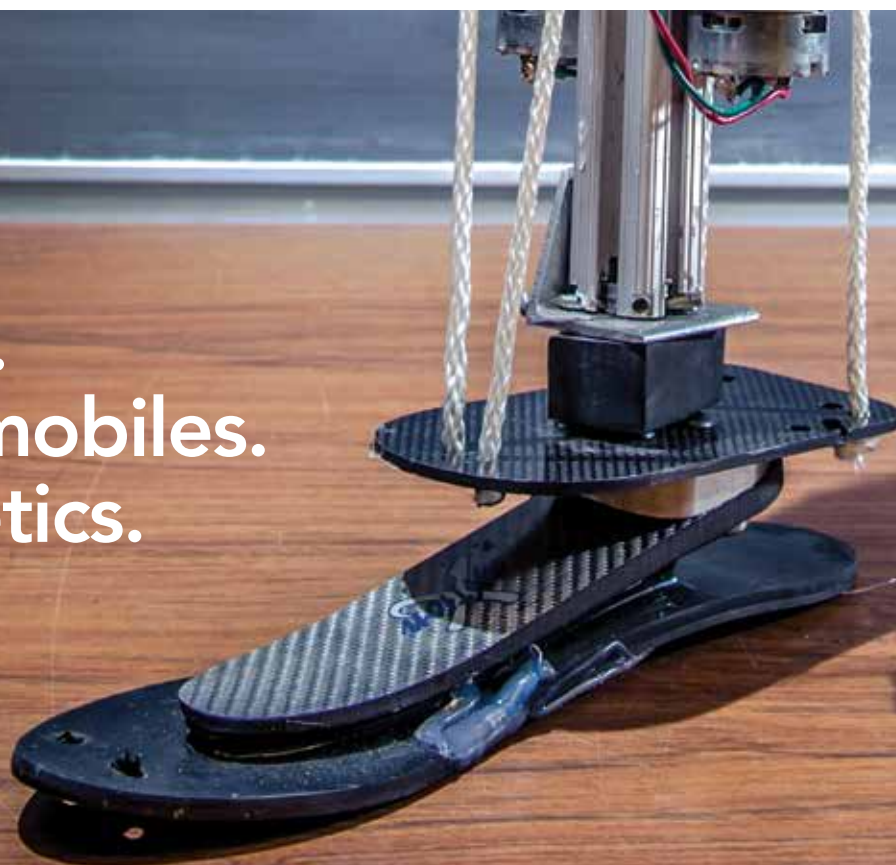


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