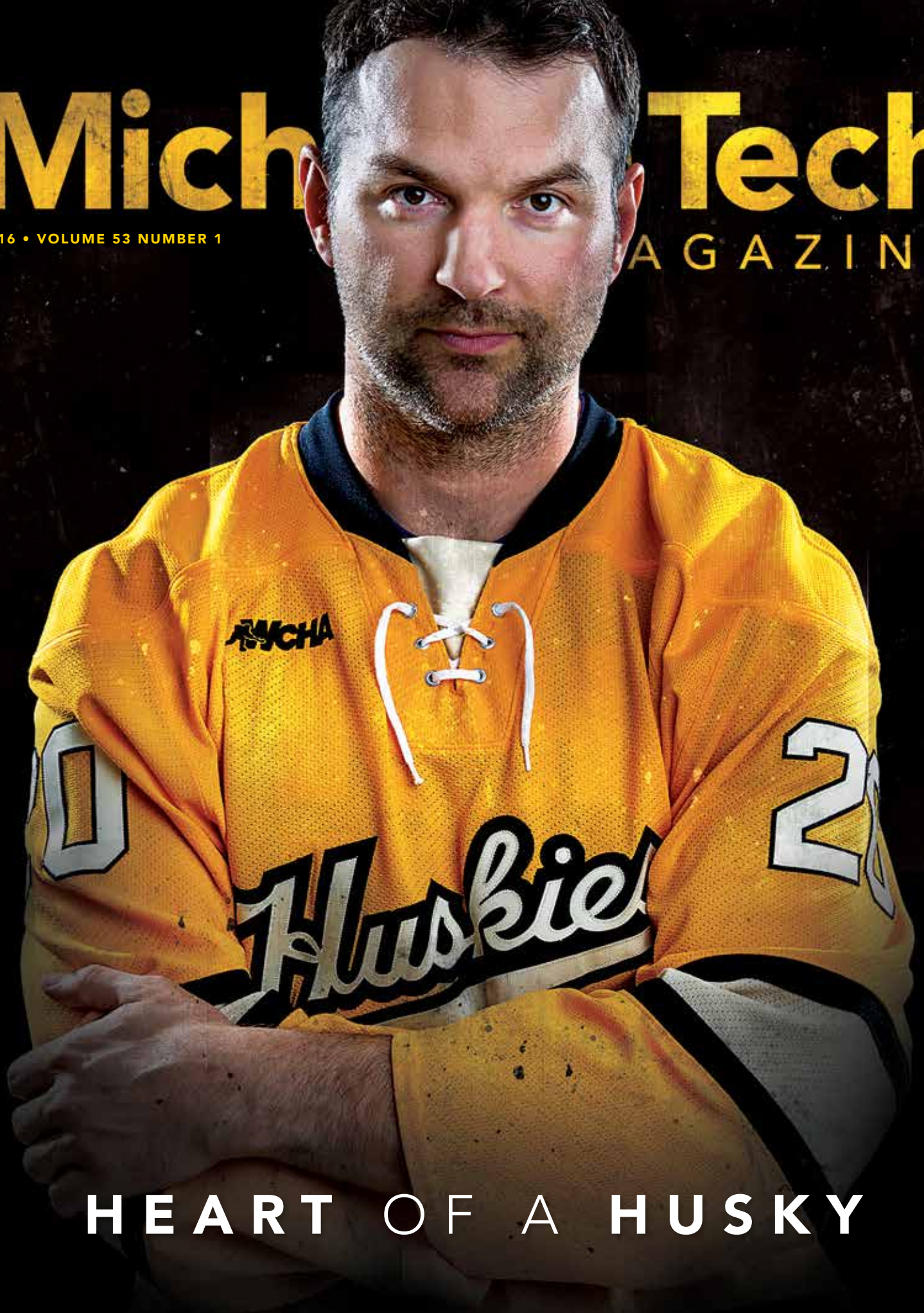


# Mich Tech

2016 • VOLUME 53 NUMBER 1

MAGAZINE



HEART OF A HUSKY

# Unveiled.

The University unveiled our new logo on February 26. Students, faculty, staff, and community gathered in the Van Pelt and Opie Library Reading Room to hear President Glenn Mroz talk about our evolution—how and why. Alumni around the world tuned into the live-streamed event. It's way more than a mark. It's more than a new look or voice. It's us. We are who we are now because of what we've always been. Open these pages and discover the Husky inside us all.



Michigan  
Technological  
University

G 2017



# Table of Contents

2016 • VOLUME 53 NUMBER 1



## Stories

### 12 Humanitarian Engineering

by Kari Henquinet

Tech alumnus Nick Schreiner fights Ebola in Sierra Leone, protects civilians in South Sudan, and helps refugees in the Democratic Republic of the Congo.

### 14 Coppertunities

by Jennifer Donovan

Local startups thrive, hire Tech graduates attracted to the Keweenaw lifestyle, and have their pasty and eat it too.

### 17 Once a President, Always a President

by Mark Wilcox

You can't look around campus without seeing the impact of former President Raymond L. Smith. As he nears 100, we look at how he came to Tech and continues to influence current President Glenn Mroz.

### 20 The Art of Design

by Allison Mills

Our students build, design, create, and code what they make is both science and art.

### 22 In the Driver's Seat

by Mark Wilcox

Reagan May wins races in Wisconsin, performs in the classroom, and is part of our strong auto racing tradition.

### 26 Heart of a Husky

by Shannon Rinkinen

NHL All-Star Game MVP, John Scott inspired a nation with his grit and determination—and his unlikely journey started here.

### 30 Oil and Water

by Allison Mills

Water and oil don't usually mix, but these interdisciplinary researchers at the Great Lakes Research Center have answers when they do.

### 34 Family Takes Flight

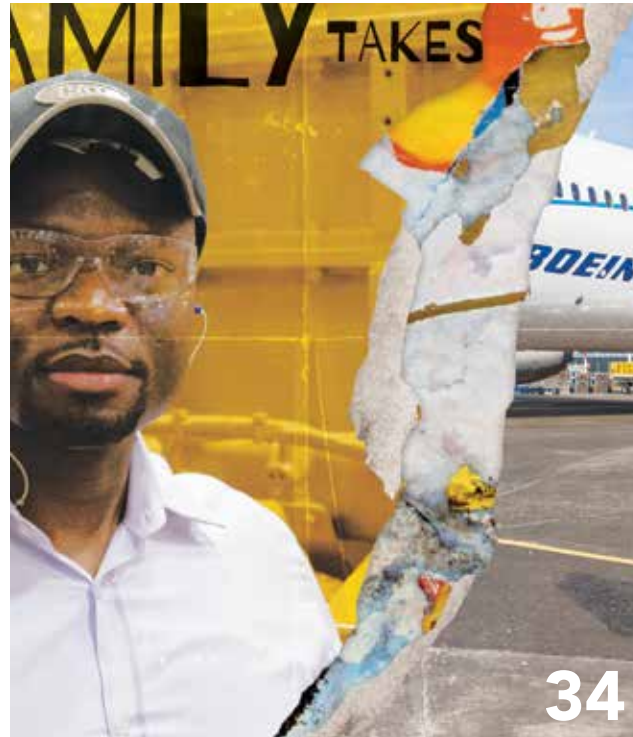
by Jennifer Donovan

Alex and Sumo Malbah lost their mother but not their way, fleeing Liberia for a new life in the US.

### 38 Something's Brewing

by Cyndi Perkins

We raise a glass to alums working their craft at breweries, wineries, and support industries across the nation.



## Regular Features

06 1400 Townsend Drive

42 Alumni Association

46 Class Notes

49 Alumni Q&A

50 In Memoriam

### Michigan Tech Magazine

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

## A diversity of efforts

Michigan Tech's focus on nurturing and expanding our diverse student body, faculty, and staff is paying dividends



**D**iversity of thought and experiences significantly contribute to the learning experience of all students and for that reason it is important that we track metrics that include, for instance, international students.

And striving for more diversity in our student, staff, and faculty numbers also means we are committed to the inclusion of populations in our educational institution who have been traditionally underrepresented or otherwise disadvantaged, whether through economic or structural barriers. As of this printing, Tech was at an all-time high for the number of domestic minority students paying enrollment deposits for Fall 2016 semester.

Looking at our efforts through a social justice lens means we also pay attention to

domestic underrepresented minorities, social economic indicators, and other populations.

A diverse student body is a consummate demand from the employer market. Employers of Michigan Tech students, and students nationwide, want to recruit from a talent pool well versed and experienced with diverse populations.

To them, a diverse set of employees means a diverse set of solutions to problems, increasing the probability of finding the most profitable one.

Specific programs by the Office of Institutional Equity and the Center for Diversity and Inclusion (CDI) include:

- + Promoting all-gender restroom signs and the gender-neutral locker room in the SDC
- + High school outreach and education on supporting trans and non-binary students
- + Collaborating with GEAR UP to bring social justice speakers to the Dollar Bay School to do workshops with students
- + Supporting diverse students in the classroom: Lunch and Learn with the videos we created and the presentation on microaggressions
- + Promoting Inclusive Classrooms Workshops
- + Hosting Cultural Competency Workshops
- + Conducting Safe Place Training
- + Presenting Social Justice Lecture Series

For a more complete list of activities and to learn more about CDI visit:

[mtu.edu/diversity-center](http://mtu.edu/diversity-center)

## Huskies on social media

### Back Where it Belongs.

The MacNaughton Cup is back home in the Copper Country this weekend as our WCHA champs take on Alaska in a best of three playoff series. Come on out to the John MacInnes Student Ice Arena and cheer on our [Michigan Tech Huskies](#). #HuskyPride



## @MichiganTech



facebook

### Who says March means mud season?

PhD student Venkata Rajesh Chundru shared this incredible shot with us. Here, early spring auroras are right outside our door.



More than 1K likes

**Tom Mack**

Wow! I forgot how beautiful the north country can be in March.

**Mason Liagre**

Whoa hope I get to see that in person

**Sherry Salome-Liagre**

Me too, it's unreal

**Renu Avinaash Maddi**

awesome click dude

**Venkata Rajesh Chundru**

it's the northern lights taken near Copper Harbor, MI

**Karen Anderson Dubrinsky**

Thank you for sharing!!

WE ASKED . . .

### Where's the craziest place you've run into Michigan Tech alumni?

LIBERIA



#MichiganTech alumni around the world! Luke Grossman '15 recently traveled to Liberia where he by chance met John Bleah '77 over breakfast at a mission compound. The pair swapped stories about the Upper Peninsula and their alma mater before posing for a photo in Tech gear.



### The crack heard 'round the world—er—in da Yoop, at least.

The Menominee Crack opened up in October 2010 and now researchers from Michigan Tech have determined it is a geologic pop-up structure.

[mtu.edu/news/stories/2016/menominee-crack.html](http://mtu.edu/news/stories/2016/menominee-crack.html)



## Design thinking drives space to create

**U**niversity Innovation (UI) Fellows nationwide are changing the way students think. UI Fellows at Michigan Tech and across the nation are teaching a fresh mindset known as design thinking, a methodology that helps users identify human-centered problems and imagine and implement innovative solutions through experimentation.

Michigan Tech's UI Fellows introduced design thinking to incoming first-year students during fall 2015 orientation week. Now they're reaching down into the elementary and middle schools, offering after-school classes called "Discovering Your Creative Confidence and Inner Maker."

The UI Fellows also sponsored an extremely popular Makerspace Workshop that generated enthusiasm for creation of a permanent makerspace. Based on input received from the more than 100 workshop participants, the UI Fellows have been working with the Makerspace Committee to develop some renderings of the space and estimates for the renovations.

There are seven UI Fellows at Michigan Tech, including four who finished their training last fall. The new fellows are Michelle Hoard, a senior in chemical engineering; Carly Joseph, a third-year biomedical engineering major; Nichole Mackey, a second-year student in software engineering; and Nate Peterson, a senior in materials science and engineering.

The Michigan Tech UI Fellows operate under Pavlis Honors College and the new Innovation Center for Entrepreneurship, with support from their faculty sponsor, Mary Raber, assistant dean of academic programs.

Funded by the National Science Foundation (NSF), the UI Fellows program is administered by the National Center for Engineering Pathways to Innovation Program, also known as the Epicenter. It is run by Stanford University and nonprofit VentureWell.

[mtu.edu/honors](http://mtu.edu/honors)



# Mouw honored with PECASE award

**P**resident Barack Obama named 106 researchers—including Assistant Professor, Geological and Mining Engineering and Sciences, Colleen Mouw—recipients of the Presidential Early Career Award (PECASE) for Scientists and Engineers.

Colleen Mouw joins fellow PECASE award recipients at a White House awards ceremony.



Colleen Mouw

It is the highest honor bestowed by the US government on science and engineering professionals in the early stages of their independent research careers.

“These early-career scientists are leading the

way in our efforts to confront and understand challenges from climate change to our health and wellness,” President Obama said.

**“I’ve been fortunate to have worked with many fantastic colleagues over the years who undoubtedly deserve this recognition just as much as myself.”**

Colleen Mouw

“We congratulate these accomplished individuals and encourage them to continue to serve as an example of the incredible promise and ingenuity of the American people,” he said. Nominations come from federal agencies who support the young scientists’ and engineers’ research. Mouw was nominated by the National Aeronautics and Space Administration (NASA).

US Senator from Michigan, Gary Peters, echoed Obama’s praise.

“I join in congratulating Dr. Colleen Mouw on her receipt of the Presidential Early Career Award for Scientists and Engineers, which is a true testament to her commitment to marine science and pursuit of innovative research,”



he said. “Her efforts to keep the Great Lakes safe are profoundly benefiting the millions of Michiganders that rely on the Lakes for clean drinking water and as drivers of economic growth through tourism, recreation, shipping, and so much more.”

Mouw expressed gratitude for the honor.

“I’m very humbled to be recognized in this way,” Mouw said. “I’ve been fortunate to have worked with many fantastic colleagues over the years who undoubtedly deserve this recognition just as much as myself.”

The awards were established by President Bill Clinton in 1996.

Awardees are selected for their

pursuit of innovative research at the frontiers of science and technology and their commitment to community service as demonstrated through scientific leadership, public education, or community outreach. Mouw received her award during a Washington, DC, ceremony at the White House in May.

## Johnson-Cash’s PhD a first for ME-EM program



Robin Johnson-Cash

Robin Johnson-Cash ‘15 is the first African American to earn a PhD from the Department of Mechanical Engineering-Engineering Mechanics. Johnson-Cash graduated in December 2015

and has worked at Ford Motor Company since 1988. She is currently the technical training manager.

# Students set up mobile health clinics, mentor on Spring Break

Medlife journeys to Ecuador



**S**tudents in Michigan Tech's chapter of Medlife spent their spring break working in Ecuador.

Medlife is an organization that partners with low-income communities in Latin America to improve their access to medicine, education, and community development initiatives.

In Riobamba, Ecuador, the group spent the first two days learning about how people in the rural areas work and live. The next four days they set up mobile clinics in schools, empty buildings, or courtyards, and went to a town sitting at 12,000 feet to work on a staircase-building project.

At the clinics the students rotated through specific stations including vital signs, education, general medicine, dentistry, and gynecology.

They recorded patients' height, weight, temperature and blood pressure, and taught them preventative medicine for tooth decay, diabetes, cancer, and heart disease. The students shadowed doctors to learn how they do medical treatment in developing countries and also assisted in the treatment of patients.

On project day they worked with locals to collect rocks, then carried them up and down a mountain to create a staircase mold to later be filled with cement. With the town sitting on a massive hill, the staircase was put in to help prevent the locals, especially the elderly, kids, and pregnant women, from injuries when attempting to trek it.

"The entire experience immersed us in a completely new culture to learn so much about simple privileges such as having a

toothbrush, hot water, and easy access to healthcare," says student-leader Madison Brooks.

Student participants included Madison Brooks, Hailey Cochrane, Braden Peterson, Braedyn Bosilovatz, Courtney Smith, Harmony Osborn, Alexandria Marks, Monica McClellan, and Erin Kalinec.

Michigan Tech student Madison Brooks (left) checks a patient's blood pressure, while Alexandria Marks helps children brush their teeth.



Learn more about Medlife's mission and current projects at: [medlifeweb.org](http://medlifeweb.org)

# NSBE members recruit high school students to STEM



**W**hile some students travel for adventure, others do it for the greater good. Once again, in collaboration with the Detroit Public Schools, the Michigan Tech Chapter of the National Society of Black Engineers (NSBE) traveled to the Motor City over Spring Break 2016 to offer free Family Engineering Nights at K-8 schools and engineering presentations at high schools during the day.

Mechanical engineering graduate student Yomi Famuyiwa of Tech's NSBE chapter says Family Engineering Nights give students and their parents the chance to experience common engineering problems and encourage them to develop creative solutions as a team.

"The engineering presentations at the high schools are tailored to inform the students about the potential career paths in science, technology, engineering, and math (STEM) fields," Famuyiwa explains. "We encouraged the students to attend college and ideally pursue STEM majors."

Famuyiwa says he enjoys the alternative spring break experience "because of the impact we can have on the students. It's one thing for the students to be encouraged by their teachers to consider engineering or going to college. It's another for minority college students who are actually studying engineering to take the time to come down to speak with the students about it. The students see real-life proof that anything they set their minds to is possible."

NSBE members (from left) Matthew Alexander, Stuart Liburd, Rebecca Spencer, Emeka Esemonu, Jalen Beck, and Bruce Brunson spread the word about engineering careers at Detroit area schools.



## CORRECTION:

In the Fall 2015 edition of *Michigan Tech Magazine* it was incorrectly stated that Brockway Mountain is in Copper Harbor, Michigan. It is in Eagle Harbor and is owned by Eagle Harbor Township.

## Rankings and Recognition

82<sup>ND</sup>

Michigan Technological University's graduate engineering programs moved up dramatically in *US News & World Report's* annual rankings of graduate school programs—to 82nd in the nation. Last year, Michigan Tech's graduate engineering programs ranked 104th.

2<sup>ND</sup>

While the University of Michigan retained the top spot in the second annual *SmartAsset* study, Michigan Tech was 2nd out of 29 public and private colleges ranked statewide. Both cost about \$26,000 to attend in-state (annual tuition of \$13,142 and \$13,728 respectively, in 2014, plus roughly \$13,000 each in annual living costs), while average starting salaries were \$58,000 and \$62,800, respectively.

163<sup>RD</sup>

The National Science Foundation has released its annual research spending report, and Michigan Tech has moved up in its rankings. Of 634 institutions that received research funding in 2014, Tech received \$68.5 million, ranking 163rd overall nationwide. The University ranked 117th among public institutions.

19<sup>TH</sup>

Mechanical engineering research at Tech received \$13.1 million in research funding in 2015, ranking 19th in the nation. Atmospheric science—a new interdisciplinary category—received \$3.1 million and ranked 34th.



Suited up for household decontamination in Freetown, Sierra Leone.



# HUMANITARIAN

## NICK SCHREINER FIGHTS EBOLA, ASSISTS REFUGEES IN AFRICA



**“YOU CAN’T  
SEE EBOLA.  
IT IS BOTH  
EVERYWHERE  
AND NOWHERE.”**

**B**eyond job placement statistics and lifetime earnings, Michigan Tech graduates make their mark in the world in ways not calculated in dollars and cents.

Peace Corps Master’s International (PCMI) alumnus Nick Schreiner ’11 is an example of someone using his engineering skills to make an impact in some of the most troubled spots on the planet: fighting Ebola in Sierra Leone, supporting displaced populations in a Protection of Civilian (POC) zone in South Sudan, and working with refugee populations in Democratic Republic of the Congo (DRC) and Central African Republic (CAR).

Schreiner has worked for Doctors Without Borders (Médecins Sans Frontières—MSF) for more than three years after completing his master’s degree in environmental engineering. While MSF is commonly

considered a humanitarian group for doctors and nurses, a large portion of staff is non-medical, including water and sanitation engineers, electrical engineers, biomedical engineers, and communications professionals.

“I tried a more traditional engineering position at a Portland, Oregon-based firm after graduation,” Schreiner says. “I found my former Peace Corps service in Mauritania and Mali had planted a seed calling me to do something more with my life.”

He started working for MSF in fall 2012 as a water and sanitation engineering specialist in the DRC. He was there for 10 months. After this, MSF called him again to work for six weeks in CAR in a refugee camp set up beside the airport in the capital city Bangui. There, MSF staff saw 10-15 new wounded patients each day on top of managing the health concerns and disease outbreaks of a refugee camp. He and his team



Water and Sanitation team (Schreiner, far right) in Ebola Management Center (EMC) in Bo, Sierra Leone.

After returning home for a short break, Schreiner took another position in Sierra Leone, focusing on outreach to communities. Here his Peace Corps experience was invaluable in understanding the everyday complexities of life in West Africa.

“Our protocols to stop the spread of Ebola were tough and contradicted natural tendencies to care for the sick, including isolating and moving them to treatment

is not in it for the adrenaline rush.

“This work can take a toll on you, but it’s the national staff that keep me going. They are incredible to work with and have a long-term commitment and impact through their work,” he explains. “You see the best and the worst of what humans are capable of, but it is a way of showing solidarity and bearing witness—*témoignage*—to share with the world the human suffering



# ENGINEERING

worked to increase access to clean water and install safe waste disposal systems.

In fall 2014 as the Ebola epidemic continued to spiral, Schreiner was asked to join a MSF team in Sierra Leone.

“This was a different kind of insecurity,” he says. “You can’t see Ebola. It is both everywhere and nowhere.”

Everyone in the Sierra Leone treatment center where he worked was uneasy; they were required to implement a “no touch” policy. In addition to working in water and sanitation, he also managed biosafety to control infection, including special procedures for waste control and removal of the deceased.

“This really stretched me outside of my engineering training,” he says. “However, I found engineering had prepared me to carefully navigate the necessary procedures and protocols in a new context.”

centers,” he says. “Sometimes sick people would be taken to these centers, die, and immediately be buried to prevent the spread of the disease. This was extremely hard for families.”

Most recently, Nick has worked in South Sudan, where he returned to a wartime context. Specifically, he was assigned to a United Nations POC zone. In April 2015 new fighting in the region swelled the POC population to 130,000, bringing abysmal water and sanitation conditions.

“With a shortage of latrines, water contamination increased and a Hepatitis E outbreak hit the population in the POC zone,” Schreiner says. “You’re often tackling the challenge of clean water and sanitation in precarious environments.”

The work is fast paced and exciting—from flying around mountains in a small aircraft to racing across a lake to address a health emergency—but he



they see, a foundational aspect of MSF’s work around the world.”

The 20-year-old Peace Corps Master’s International Program at Michigan Tech has 63 enrolled students and more than 175 alumni. In April, Peace Corps announced that it will begin phasing out all Master’s International partnerships across the nation.

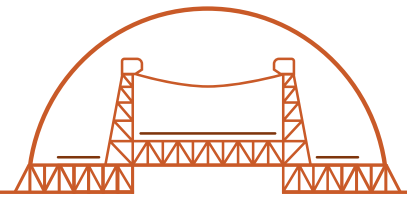
*This fall, the last cohort of Master’s International students will enter Michigan Tech’s program. These and all current students will be allowed to complete their studies and service as planned. Michigan Tech and the Peace Corps are currently exploring new partnership models.*



Schreiner working in his water and sanitation office.

[MTU.EDU/PEACECORPS](http://MTU.EDU/PEACECORPS)

**H**igh-tech startup companies are revitalizing the Copper Country. The Michigan Tech Enterprise Corporation (MTEC) **SmartZone**—formed to nurture high-tech startups—confirms it, and the firms themselves—dozens of companies—have created hundreds of jobs.



The Michigan Economic Development Corporation (MEDC)—the state agency charged with promoting exactly this kind of economic revitalization—credits the upward arc to the SmartZone and Michigan Tech.


strong partner in helping high-tech startups develop and flourish. Between Michigan Tech and the SmartZone, attracting and retaining talent has been a great success.”

“The MTEC SmartZone in Houghton has a tremendous impact on the local and regional economy,” says Fred Molnar, MEDC’s vice president of entrepreneurship and innovation. “And Michigan Tech is a

Meet two recently formed startups that are working hand-in-hand with Michigan Tech to develop and market the high-tech products and services that are helping turn the Copper Country economy around.

# COPPERTUNITIES

## NEUVOKAS



Basalt fiber-based rebar weighs seven times less, and is twice as strong as some steel-based rebar.

Basalt. You see it everywhere in the Copper Country. It’s the volcanic rock from which the area’s namesake ore was extracted, leaving piles of fragments still rich with copper and silver.

biomedical engineering alumnus who joined Neuvokas as vice president for engineering, the role he still plays today.

So, thought Erik Kiilunen and Ken Keranen—businessmen, engineers, and fiercely loyal residents of the Keweenaw—why not use local basalt to make the rebar that reinforces concrete in roads, bridge decks, and buildings? Basalt fiber-based rebar would be stronger, lighter, and more resistant to alkalinity, which can cause concrete to expand and crack.

**“We had to invent the product; we had to invent the process.”**

**Matt Kero**

With the help of the SmartZone, Neuvokas secured funding for the venture: a \$40,000 State of Michigan business accelerator fund grant. This initial grant has since snowballed into a \$150,000 Phase I Small Business Innovation Research (SBIR) grant that has grown to \$875,000 with the addition of a Phase II SBIR.

Three years ago, Neuvokas was born. Neuvokas is a Finnish word that means “inventive and creative.” The Neuvokas Corporation, with a manufacturing plant in Ahmeek, has invented a new, high-speed process to produce cost-effective fiber-reinforced polymer (FRP) rebar that is already making an impact on the construction industry across the nation.

The company refurbished an old mining building in Ahmeek and built a rebar manufacturing facility from the ground up.

“We had to invent the process,” says Kero, who is so proud of his company’s product that he hands out key chains sporting small rods of the rough, black rebar. The rebar is 80 percent basalt fiber and 20 percent polymer resin.

Keranen is a 2003 Michigan Tech mechanical engineering alumnus, and the company’s first hire was Matt Kero, a 2006 mechanical and

With the rebar production process developed and process speed increasing regularly, Neuvokas will begin turning its attention to producing the basalt fiber it uses in its rebar. If possible, the company intends to use the local poor rock from mining activities of years past.

"Assuming we can do this, extract the copper and silver from the poor rock and turn what used to be waste basalt into fiber, Neuvokas will truly have a triple bottom-line venture," says Kiilunen. "We can provide meaningful local employment while producing a valuable product for export, and at the same time potentially cleaning up our local environment. This is a rare opportunity, and Neuvokas is aggressively pursuing it."

Until this is developed, the company will continue to buy its basalt fiber from China, 40,000 pounds at a time.

Neuvokas has cracked a major market in Houston, Texas. Last fall, the company shipped 250,000 feet of FRP rebar to Houston. It weighed seven times less than the same amount of steel rebar. Kero likes to say that FRP rebar can be shipped on a pickup truck instead of a flatbed.

With Michigan Tech alumni at its heart, it's no wonder that Neuvokas is forging strong ties with Michigan Tech. Paul Fraley, an engineer-scientist in the Department of Materials Science and Engineering, and his students are testing Neuvokas's rebar. They're doing tensile strength and shear tests, durability testing, creep testing, and fatigue testing to determine the conditions that would make the rebar fail.

"We're simulating some of the worst-case conditions the rebar will see in concrete," Fraley explains.

**"Any time we can help these little companies grow and become stable, it's good for everybody."**

**Paul Fraley**

The testing has demonstrated that the FRP basalt rebar is stronger than a fiberglass bar and twice as strong as some grades of steel rebar. Also, "it's great experience for the students," says Fraley.

"Any time we can help local startups grow and become stable, it's good for everybody," he adds. "It's good for the community; it's good for the economy. And it enables a few lucky students to stay and work in the Copper Country after graduation."

That's already happening at Neuvokas. The company has expanded to 10 employees,



Paul Fraley (left) works with a Michigan Tech student testing Neuvokas rebar.

including a Michigan Tech student intern, and Kero hopes to have 30 employees within the next couple of years. "We're planning to start a second shift soon," he says.

Jeff Ratcliffe, executive director of the Keweenaw Economic Development Alliance, credits Michigan Tech with playing "a pivotal role in not only spawning technology and entrepreneurs that evolve into companies and new jobs, but in providing the engineering, research, and development talent that our startups and existing companies depend on to succeed."



Lynn Eliason  
President of GS Infrastructure

## GS INFRASTRUCTURE

Lynn Eliason has never slammed into the glass ceiling, so she wasn't surprised when Glen Simula, president of GS Engineering, asked her to be president of a new spinoff company, GS Infrastructure.

"I've never been singled out for being a woman," says Eliason, whose company offers non-destructive evaluation services to analyze the infrastructure of bridge decks. The fledgling firm, almost one year old, already has customers in 10+ states and the District of Columbia, mostly departments of

transportation and civil construction companies that contract to manage bridges.

GS Infrastructure uses imaging technologies like infrared thermography—which measures heat transfer to "see" cracks or other areas showing stress under the surface of the bridge—and ground-penetrating radar that produces 3-D images of the situation deep inside.

Until these technologies came along, evaluating the structural problems of bridge involved chain-dragging and hammer-sounding—literally

dragging a chain across the bridge surface or pounding on it with a hammer, to listen for sound variations that might indicate cracks or other issues. It is slow, labor-intensive, and behind in technological advances.

Using GS Infrastructure sensor technologies, bridge managers can see exactly where and how much of a bridge is compromised and how seriously. "We give them the tools to decide what has to happen," says Eliason. "Do I want to patch it? Do I need to replace it? They can see the answers." Eliason, who has a

BA in Business Administration from Michigan Tech and a Master's in Leadership from Marquette University, had worked with GS Engineering in Houghton as director of operations for the past five years.

When Simula decided to create a civil arm to his enormously successful GS Engineering—MTEC SmartZone's first and greatest startup accomplishment—he tapped Eliason, who said she didn't hesitate to say yes.

"I like to accept a challenge," she explains.

The first year has been a bit of a roller coaster," says Eliason, "making sure we have all the right resources, the skill sets, the right technologies, and the right people, problem-solvers who are willing to learn and to ride the ups and downs." Those problem-solvers are a big reason that GS

GS Infrastructure already has one student intern and plans to hire more in the coming school year. "We appreciate how many skills interns from Michigan Tech bring with them and apply those skills with our companies," says Eliason.

One of GS Infrastructure's past projects was a joint one with the Michigan Tech Research Institute (MTRI), using infrared thermography field scoping to analyze the infrastructure of bridges and roads, as part of a larger project for the Michigan Department of Transportation.

"GS Infrastructure is a good example of a local engineering company developing sensor technology, then teaming with the civil engineering department at Michigan Tech to conduct a research project for MDOT," says Simula. "This demonstrates the synergy of a Michigan small business working with Michigan Tech faculty to solve current problems for our nation's aging infrastructure."

The sensors are already being used on bridge decks across the nation. And GS Infrastructure is just getting started. The same technologies can be adapted for roads.

Then on to airport runways. You might say the sky's the limit for this Keweenaw startup.

**"It enables a few lucky students to stay and work in the Copper Country after graduation."**

**Paul Fraley**

Infrastructure—and GS Engineering—love their location, its proximity to Michigan Tech. Eighty-five percent of their employees are Michigan Tech graduates. "They are excellent problem-solvers," Eliason explains. "They know how to work in a team and follow through to a solution. They know how to move ahead."

## SMARTZONE HELPS DRIVE KEWEENAW JOB GROWTH



Marilyn Clark '73 '76 calls it "economic gardening." That's what the Michigan Tech Enterprise Corporation SmartZone does. And its crops are thriving, bringing high-tech jobs to the Copper Country.

Since it was formed in 2003 with funding from the Michigan Economic Development Corporation, the MTEC SmartZone has worked with hundreds of clients looking to form or grow tech-based companies, and those startups have created at least 700 jobs.

It's a collaborative effort. The SmartZone partners with Michigan Tech, where marketable technologies spin out of research labs, with the cities of Houghton and Hancock, and with the Keweenaw Economic Development Alliance.

The SmartZone is both a business incubator and an accelerator. They recruit large- and medium-sized companies wanting to open satellite offices near Michigan Tech—a fertile source of interns and skilled graduates—while using cost-effective facilities within a vibrant community. It helps would-be entrepreneurs learn to transform a great idea into

an even greater business opportunity.

"Through the SmartStart program, a strong pipeline of entrepreneurs enter the incubator and grow their companies in the community," says Fred Molnar, vice president of entrepreneurship and innovation at the Michigan Economic Development Corporation.

**"As the number of companies and jobs grows, the productivity and positive culture of the whole community grows with it."**

The SmartZone also provides facilities at three locations: Michigan Tech's Lakeshore Center, the old Powerhouse in downtown Houghton, and the Jutila Center in Hancock. And they can tap the expertise of an army of consultants who can help startups negotiate the intricacies of legal requirements, human resources, accounting, payroll, and marketing.

Through TalentBridge, the SmartZone markets the Copper Country's unique resources: Tech's engineering students and faculty, well-maintained and cost-efficient facilities, and a vibrant community in an unequalled natural setting.

"We already are a high-tech business hub," says Clark. She predicts that the area will soon become known as "Innovation Shore."

**mtecz.com**





Former Michigan Tech President Raymond Smith has been a friend and inspiration to current President Glenn Mroz.

# ONCE A PRESIDENT, ALWAYS A PRESIDENT



Tech's growth under Ray Smith cannot be overstated. Soon to celebrate a century, this visionary created a Husky-strong foundation that still guides us today.

Former Michigan Tech President Raymond L. Smith turns 100 years old in January. His influence reshaped the University and its direction for generations to come.

The Maine native received his bachelor's degree from the University of Alaska, where he would return to teach for three years following his Army service during World War II. He planned to earn his doctorate at Harvard, but instead followed legendary professor Robert Brick when he left Cambridge for Philadelphia. Smith earned his PhD in metallurgical engineering in "record time" from the University of Pennsylvania.

He stayed in the City of Brotherly Love after graduation, working at the Franklin Institute of Research. He was the head of Solid State Physics and a technical director of the Institute of Research before he came to Michigan Tech in 1959.

"The reason I went up there was because of Marty Caserio," Smith says from his home in Arizona. "He was a major figure at Michigan Tech and headed up Chevrolet."

The late Martin Caserio, a Laurium native, Michigan Tech alumnus, and General Motors Group vice president, served on what was then known as Michigan Tech's Board of Control in the 1980s.

Smith became chairman of the Michigan Tech Department of Metallurgical Engineering, which quickly rose to national prominence under his leadership. After six years at Tech, he became the University's sixth president.

One of his major contributions was the creation of the culture of philanthropy. "When I came here I was told 'You can't talk about money. You can talk about hockey, but we don't raise money here,'" Smith says. That changed. Working with Caserio, Smith established a foundation to benefit the University. "We were only taking in about

\$30,000 a year (in contributions) when I got here. It didn't take long to make it millions," Smith says.

**"The reason I went up there was because of Marty Caserio," Smith said from his home in Arizona. "He was a major figure at Michigan Tech and headed up Chevrolet."**

Michigan Tech's astounding growth under Smith was noted in a May 1978 article in Houghton's *Daily Mining Gazette*. After just 12 years on the job, Smith had signed 10,133 diplomas. That number just so happens to equal the number of graduates dating from the University's founding in 1885 to when Smith assumed the presidency in 1964.

"Ray's signature was on both my BS and MS from Michigan Tech," says current Michigan Tech President Glenn Mroz, who in 2004 became the ninth president in Michigan Tech history. "But as a student, like most students, I only had the chance to meet him at the welcome and commencement."

Before he was officially appointed president, Mroz reached out to former University leaders.

He called Smith in Arizona to introduce himself, keeping in mind that another former president, Dale Stein, also lived there.

"I said I was the interim president," Mroz remembers. "He said 'I heard.' Long pause. I said 'well, uh . . . my wife Gail and I would like to come out and meet you, maybe go to dinner. We're hoping to see the Steins as well.'"

After another pause, Smith told him to come to his place for dinner—and said he'd invite the Steins. "Whew! Success," Mroz recalls.

Following dinner and the "break the ice small talk" Smith looked at Mroz and with "gravity in his voice" asked, "So Glenn, what the hell are you going to do for Michigan Tech?" Mroz says there was yet another long pause, "I thought, 'nobody is going to rescue me.' I wasn't at the kids table for this dinner. It was clear that just as there is no such thing as a former Marine, there are no former presidents of Michigan Tech."

A spirited conversation ensued about plans, direction, strategy, enrollment, education trends, and more. It's a conversation that has continued through the years, developing into a relationship that is special to both men.



President Smith's leadership was critical for the construction or acquisition of nine campus buildings.

"My friendship with Glenn is very important to me. He's done a wonderful job and he keeps in touch," Smith says.

Tech's Assistant Vice President for Advancement Eric Halonen has been meeting with Smith at least once a year since 1999. "He still has the small projector that he used in the 1960s to 'sell' the Lansing legislators and local community on his long-term campus plan," Halonen says, adding that Smith also kept the printed plan from back then.

"He's gone over it with me with great enthusiasm a couple of times over the years. It's amazing how close we've followed it over the succeeding decades."

Halonen says the value of connections Smith made during his time at Tech endures.

"Ray continues to have a strong network of Copper Country friends and former employees. In recent years, several members of his campus leadership team from the '60s and '70s have made major gifts to the University."

"Their experience working under Ray at a time of rapid University expansion and accomplishments was no small part of their motivation to make a gift. It was an exciting time in the University history and they were proud to be a part of it."

Halonen notes that Smith himself is a major donor and member of the Second Century Society. During the "Generations of Discovery" capital campaign, he endowed the Raymond L. Smith Award in the Department of Athletics. The award is presented annually to the outstanding male and female senior athlete of the year.

During his tenure, enrollment grew from 3,400 students in 1965 to nearly 8,000 in 1979-80.

Faculty numbers nearly doubled during that period as well.

The physical growth of the University is as impressive as enrollment numbers. Buildings constructed or acquired during Smith's tenure include the Administration Building, Electrical Energy Resources Center (EERC), U. J. Noblet Forestry Building, Chemical Sciences and Engineering Building, Student Development Complex, McNair Residence Halls—East and West, Gates Tennis Center, Upper Daniell Heights Apartments, and most famously, the R. L. Smith Building (MEEM) in his honor.

Mroz says he didn't recognize it at first what later became clear to him: Smith came to Michigan Tech to change Michigan Tech.

"Not willy nilly change, but change, as (author) Jim Collins suggests, what needs to change, never change what shouldn't change, and it's the president's job to know the difference. As a top-shelf researcher, Ray saw the role of research and development in a technological university as the logical marriage with a hands-on, mind-on education."

Mroz credits Smith as beginning the process of moving Tech toward its role as a research university, increasing the level and stature of programs, and accelerating the pace of change.

"Toward what Michigan Tech is today and what it needs to be in 2035 and 2045, to be a place of consequence," Mroz says.



Announcement of Raymond L. Smith as new President of Michigan Tech, Fisher Hall, December 12, 1964.

## Mroz credits Smith as beginning the process of moving Tech toward its role as a research university, increasing the level and stature of programs, and accelerating the pace of change.

## Buildings constructed or acquired during Smith's tenure

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- Gates Tennis Center
- Upper Daniell Heights Apartments
- R. L. Smith Building (MEEM)

### Wrist Cast

3-D printed, orthopedic,  
geometric

Senior Design—  
2nd Place

Department: Biomedical  
Engineering

Sponsor: Materialise



### Bike Pedals

Bluetooth,  
quick release,  
magnetic

Enterprise:  
Velovations—  
1st Place

Sponsor: Pavlis  
Honors College



### Metal Microtubes

Extruded, friction stir-back,  
manufacturing

Senior Design

Department: School of  
Technology

Sponsors: ArcelorMittal,  
Michigan Tech



## THE 2016 DESIGN EXPO

From a satellite whale-tagging system, to a low-cost hospital ventilator, to a 793-mpg supermileage vehicle, each year Design Expo highlights our student innovators. Here are a few projects from this spring's showcase.

LEARN MORE

[blogs.mtu.edu/expo](http://blogs.mtu.edu/expo)

### Combo Paddle

Kayak, canoe, portage

Enterprise: General and Expedition  
Adventure Research (GEAR)

Sponsors: Pavlis Honors College,  
The Outdoor Adventure Program



# T H E A R T



### Haul Truck

Autonomous, mining, lab-scale

Senior Design

Department: Geological and Mining Engineering and Sciences

Sponsors: Research Excellence Fund—Research Seed Grant, School of Technology, GMES



### Healthcare Bracelet

Hand hygiene, noise, reminder

Senior Design

Department:

Biomedical Engineering

Sponsor: Aspirus Keweenaw



### Mini Circuit Boards

Outreach, light-up, Husky

Enterprise: Blue Marble Security

Sponsors: ArcelorMittal, Halla,

Oshkosh, Caterpillar

### Aluminum Casting

E357, silicon reduction, foundry-made

Enterprise: Advanced Metal Works

Sponsor: Eck Industries



### Sleep Apnea Device

Jaw protraction, airflow, hardware

Senior Design

Department: Biomedical Engineering

Sponsor: Michigan Tech



# IN THE DRIVER'S SEAT



## REAGAN MAY BREAKS RECORDS AND BARRIERS

---

When Reagan May was nine years old, she went to a bowling alley with her family in her native DePere, Wisconsin. What happened next changed the course of her life, and it had nothing to do with strikes and spares.

"Someone was there with a go-cart," the mechanical engineering student at Michigan Technological University says. "I sat in it, and I knew right away that's what I wanted to do."

That innocent experience has blossomed into an impressive racing résumé, especially for someone in their early 20s.

As you might expect, May began her racing career with go-carts, along with her brother. After a couple of years, she advanced to mini-stocks. At the age of 15—before she could legally drive a vehicle in Wisconsin—May was speeding around the state's racetracks in Super Late Model stock cars, the highest class in short track racing.

May says even though she is a rare female in the male-dominated sport of auto racing, most of the pushback she's received so far has not been because she's a woman.

"Maybe female drivers 20 years ago had to deal with those issues, but I really haven't seen it," she says.

Actually, in some instances being a woman has opened doors for her, but it doesn't mean she hasn't faced some resistance.

"If I've been treated differently on the track, I don't think it's because I'm a girl," May says. "On the track it's really not gender that matters. If I get any grief, I think it's because of my age."

She says what many of the men who compete against her weekend after weekend don't realize is, that despite her youth, she is a seasoned veteran on the Super Late Model circuit.

"I been doing this since I was 15," she says. "I worked my way up to this point. I'm



Ready to run.  
Reagan May  
behind the wheel  
in a TUNDRA  
Super Late Model  
Series race.

not competing at this level because I'm a girl. I've been around a while."

May handles these prejudices, like she handles everything in her life—through hard work.

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"I THINK BEING ABLE TO USE WHAT I LEARN AT SCHOOL HELPS. UNDERSTANDING HOW WHAT WE DO IN THE SHOP CAN AFFECT THE CAR ON THE TRACK MAKES ME A BETTER DRIVER."

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"How you handle yourself is the key. I think I've gained respect from drivers and others in the racing profession. Of course respect does come from winning."

And win she does.

May competes in the TUNDRA Super Late Model Series, where she was named Rookie of the Year in 2014. A car fire early in the 2015 season extinguished any hopes of a 2015 TUNDRA Series championship run, and she finished at No. 17 in the final standings of the 60 drivers in the series. This year she is not competing for TUNDRA points as school commitments forced her to miss the first race of the season.







While she was pinning her hopes last season on her first TUNDRA Championship, May and the checkered flag were not strangers. Out of her first 22 starts last season she picked up six feature wins,

May putting her Tech mechanical engineering courses to good use at Coleman Racing Products, Menominee, Michigan

14 top-five finishes, and 17 top-10s.

With one win and several top-five finishes at Golden Sands

Speedway events in Plover, Wisconsin, last summer, she claimed her first-ever Super Late Model track championship. That championship was the first by a woman in the Badger State and only the fourth by a woman in the United States.

Wins at the Sands Speedway in Marquette County and Kinross in the Eastern Upper Peninsula earned her the U.P. Challenge earlier last season.

May's success has not gone unnoticed in the racing world. Last season she was one of only seven drivers—and the only woman—in the 2015 Kulwicki Driver Development Program, established by the family of late NASCAR champion Alan Kulwicki.

The Greenfield, Wisconsin, native, who died in a plane crash in 1993, began his career, like May, on the short tracks of Wisconsin. He progressed to NASCAR, where he was the 1986 Rookie of the Year and won the Winston Cup in 1992. According to its website, the Kulwicki Driver Development Program aims to “help worthy drivers along the way in reaching their dream, while at the same time keeping Kulwicki’s memory and legacy alive.”

The comparisons between May and Kulwicki don’t end at the track. The late champion earned a bachelor’s degree in mechanical engineering from the University of Wisconsin-Milwaukee. May will receive hers from Michigan Tech in December or next spring.

May believes her Michigan Tech education is the key to her racing success, as the focus of her studies is automobile suspension. Because Super Late Models use sealed engines, essentially outfitting each competitor with the same motor, the car’s suspension, how it handles around the track, is what makes each car different from the others. “Suspension is key,” she says. “It’s where we find our speed.”

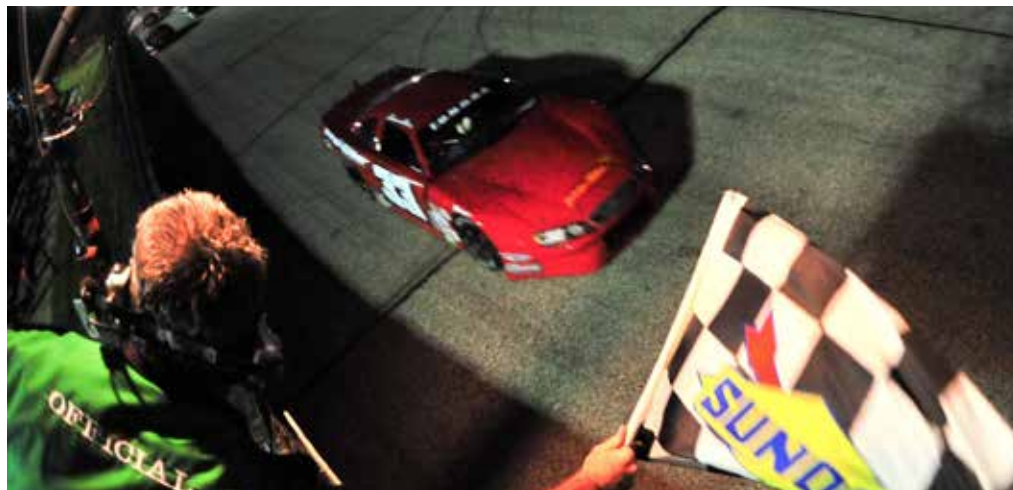
That, she says, is where her Michigan Tech education comes in. “I think being able to use what I learn at school helps. Understanding suspension, how the car actually works, is important. Understanding how what we do in the shop can affect the car on the track makes me a better driver.”

But her education is a double-edged sword, of sorts. A mechanical engineering degree is certainly the kind of pedigree NASCAR appreciates. But making it to the big show could come with a price she’s not ready to pay.

“My ultimate goal would be to make it to NASCAR as a driver. But without major sponsorships, I won’t have the resources. Realistically I would like to make it to NASCAR. But if I do, it will be as a car engineer. To do that, it would require me to give up my dreams of being a driver. Right now, I’m just not ready to do that. Driving is my passion . . . it’s my life.”

At least for this summer, weekends find Reagan May behind the wheel of a race car, seeing her dreams come true, one left turn at a time.

Racing in the #33 car, May was the 2014 TUNDRA Super Late Model Series Rookie of the Year.



~~Toronto,~~  
~~Minnesota,~~  
~~Chicago,~~  
~~New York,~~  
~~Buffalo,~~  
~~San Jose,~~  
~~Arizona,~~  
~~St. John's,~~  
~~Montreal,~~  
Houghton

Fresh off his whirlwind season, NHL All-Star MVP John Scott drops his now-famous gloves to talk to his alma mater.

# HEART OF A HUSKY

## PRECISE. METICULOUS. INTELLIGENT. THAT'S A MECHANICAL ENGINEER.

Goofy toothless goon (his words—not ours) ready for a scrum. A haymaker. Or an old-fashioned donnybrook. That's NHL enforcer and Michigan Tech mechanical engineering alumnus John Scott.

Tenacious, we say.

It took a guy like John to put Michigan Tech on a stage it seldom sees. Because his story—one he never intended to write—started here.

"I was satisfied with a college scholarship. That's why I was playing hockey," John says. Like a lot of Huskies, he didn't come from privilege. "I'm a blue-collar Canadian. My dad worked in construction out of grade 10 and my mom quit school after grade 11." In college, John had no professional hockey ambitions. That was until he met former Huskies Hockey Assistant Coach Ian Kallay. "He said, 'You can do this. You can make a career out of this. If you put in the work, put in the hours.' It was a huge moment for me," John recalls.

## GOING PRO

John and Ian spent hours training together. "We went in early and worked on first pass, foot drills for speed, puck handling . . . basic stuff. We had a routine John did in the morning and again after practice. He wanted to get better—he saw the vision," Ian says. At 6-foot-8, 268 pounds, John had all the tools. The reach. Good hands. He just needed confidence. "He had a lot of things other players didn't, plus a mean streak that would serve him well at the professional level. I see him on TV now and everyone likes him. He's always been that way. Smart. Witty. A good guy to have on your side," Ian says.

Six teams, eight seasons. John Scott got into the NHL because of hard work—hustling. It's not unlike Tech's 1,762 ME majors. Engineering sense helps, sure, but it's time in the books, in the lab, that count.



Mark Giordano, Calgary Flames (left) and Brent Burns, San Jose Sharks (right) celebrate John's 2016 NHL All-Star Game MVP award after his two-goal performance.

## THE HARD WAY

"Tech is not an easy school . . . the academics or just walking to class." John says, recalling how the north winds whipped as he lumbered to his least favorite class—chemistry.

Rigorous courses combined with 10-hour bus rides for hockey made graduating on time impossible. By the time John contracted with the Minnesota Wild, he still wasn't a college graduate. "I went back and took classes two summers in a row. I wasn't going to waste four years for nothing."

John Scott graduated with a BS in Mechanical Engineering from Tech in 2010.

How does his degree impact his game? "It definitely helps me pass a puck. I'm better than most at figuring out a bank pass off the boards. And most guys sharpen their skates to one-half of an inch. But I know how to increase—or not increase—my bore," he says.

Hockey fans the world over know about the season John had. What started as a light-hearted online vote spiraled into a new reality for John, bouncing from All-Star contender, to

the American Hockey League's IceCaps, and back to the big game for two goals and a share of the \$1 million prize.

John Scott, All-Star Game captain and MVP, became the feel-good sports story in the nation.

Unfiltered and unapologetic, he's adjusting to slapshots in the spotlight. "I posted a beer on Instagram the night of the All-Star game . . . it didn't go over so well. I have to watch what goes out to the world now. It's easy to misconstrue context." And it's true, he says: a movie about

him and his gypsy life in the NHL is in the works. Written and produced by Mitch Albom, the story will take audiences back to John's former stomping grounds.

"Houghton will be a big part of the movie because it's a big part of what made me." Who will play our humble former Husky? "I don't know yet. Liev Schreiber? I'm not exactly a polished guy."

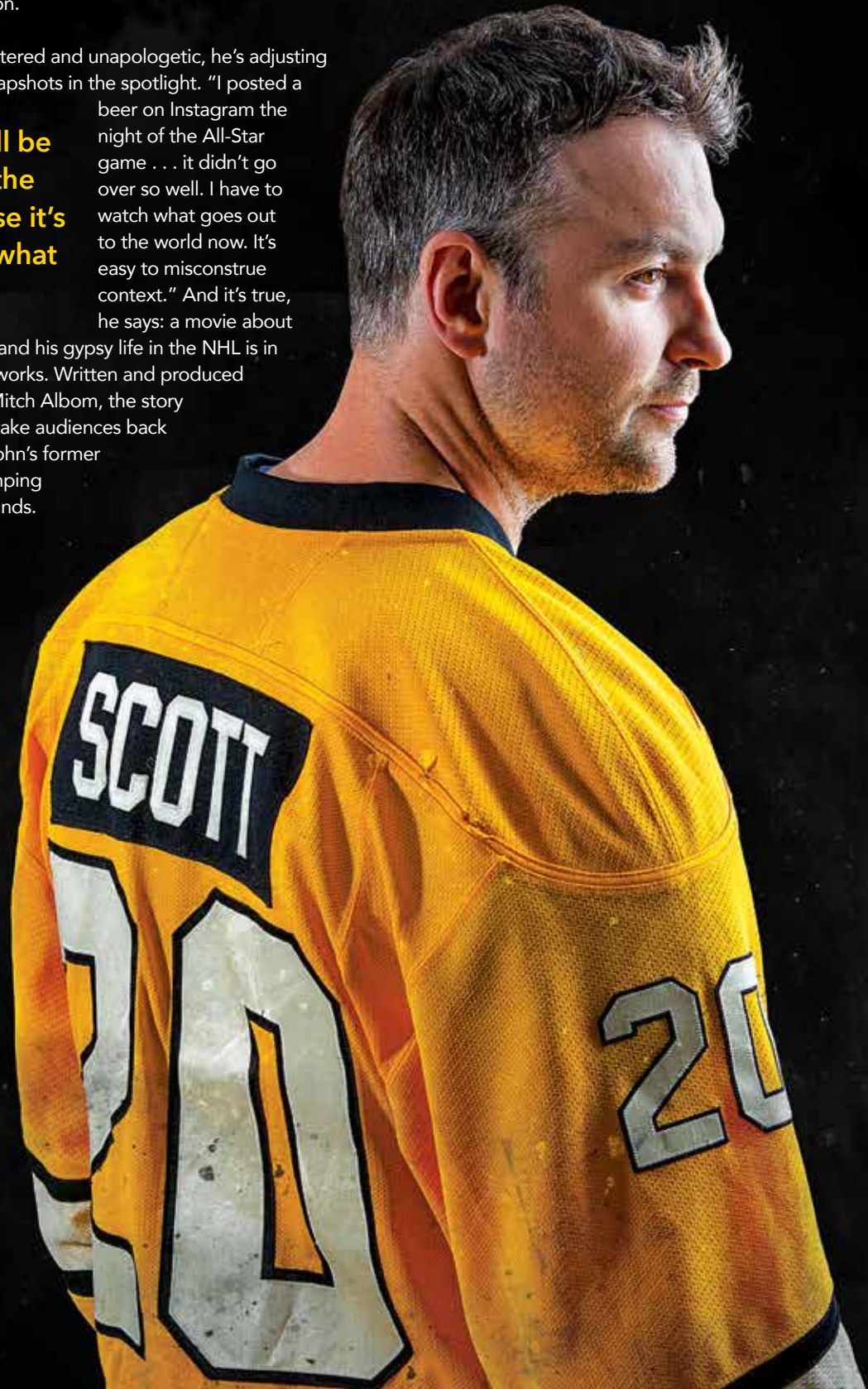
**"Houghton will be a big part of the movie because it's a big part of what made me."**

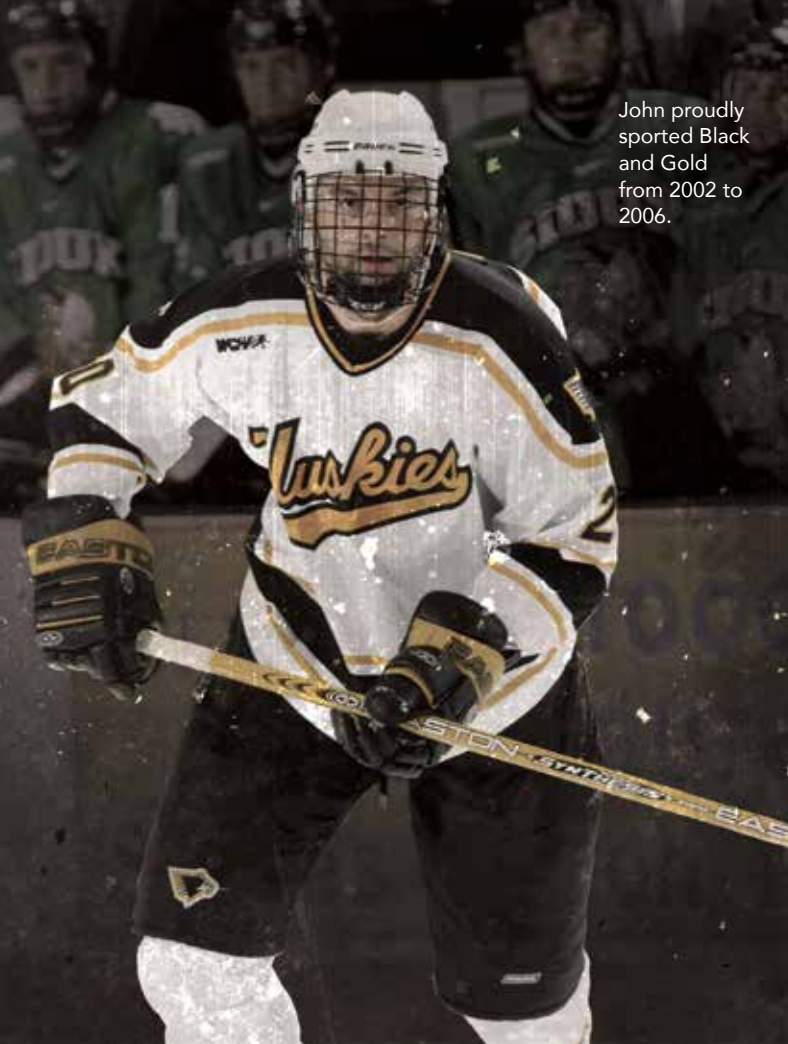
**"John Scott never gave up on himself, and he never let anyone tell him he wasn't good enough. You can't create a better story of hard work and perseverance paying off against all odds. I want people to see the amazing man John is, both on and off the ice."**

Mitch Albom



Follow John: @JHS\_32





John proudly sported Black and Gold from 2002 to 2006.

## ALL IN THE HUSKY FAMILY

Alumna Danielle Scott stepped away from her role with leading biomed company Boston Scientific to care for the couple's now four kids—Eva, 4, Gabriella, 2, and four-month-old twins Sofia and Estelle.

“My oldest definitely thinks like an engineer. She’s always asking very inquisitive questions and trying to figure out how to make things work better.”

In her (rare) downtime, she designs children’s clothing for her line Light in Me. [lightinme.net](http://lightinme.net)

### FUTURE HUSKIES?

Will any of the Scott girls follow in their engineering-parents’ footsteps? “My oldest definitely thinks like an engineer. She’s always asking very inquisitive questions and trying to figure out how to make things work better,” John says.

John and Danielle Scott enjoy a little down time with their four daughters at their home in Traverse City, Michigan.



### STILL 906

Ambo ‘za. Trips north to the Harbor. And puck with teammates and friends-to-this-day Chris Conner, Cam Ellsworth, and John Hartman. For John, Copper Country means carefree. Friends. Freedom. “Houghton is a small town, so I got a chance to not only have fun, but to focus. It’s a school first and everyone in the

community wants you to do well,” John says.

He and wife Danielle, herself a 2006 biomedical engineering grad, bring their growing family back to campus often. “We visited last summer. The bronze Husky statue wasn’t around

when we were in school. It’s cool students have something to latch onto, like ‘Big Green’ or U of M.”

Look John up today and you’ll still dial 906. “The number hasn’t changed. Some of the best days of my life were spent up there,” he says. John hasn’t changed much either. He knows he has more work to do. “I’m only 33. I’d like to play a few more years, hopefully in the NHL. I thought I’d go into engineering after all this, but what happened this winter has opened so many more doors . . . broadcasting, management. It’s exciting. You never know what’s in the future.”



# OIL + WATER

In collaboration with energy company Enbridge, researchers from the Great Lakes Research Center deploy a buoy in the Straits of Mackinac to monitor environmental conditions.



**The glass is half full. Half is oil; half is water. A thin band, more a trick of the light, marks where the two clear liquids meet in the rounded chemistry flask. The oil and water, of course, don't mix.**

Resting on a cork stand, the flask sits high on a shelf in Guy Meadows' office. Meadows, director of the Great Lakes Research Center (GLRC) at Michigan Tech, reaches up and pulls the flask down. The contents slosh; a narrow piece of pen cap surfs in the middle, trapped at the interface. With a delicate swirl, Meadows gets a small wave moving, much like the slop of water in a bathtub, several emulsified bubbles clinging to the tipping oil and water surface.

Contained in a flask, the movement is hypnotizing—beautiful even. But in the environment, we try very hard to keep oil and water separate. To date, the majority of oil spill research focuses on saltwater environments and little has been done in freshwater. Scientists at the GLRC are remedying that. Using high-tech equipment and extensive fieldwork, they are working to help prevent spills, monitor and assess at-risk locations, predict spill patterns with supercomputer models, and understand oil-eating microbial communities across the Great Lakes.

### UNDER THE SURFACE

Oil floats on water. Usually. But as the complexity of the 2010 *Deepwater Horizon* spill in the Gulf of Mexico showed researchers, understanding what happens below the waves is crucial to mitigating an oil spill.

Meadows uses the water-oil flask from his office, which he calls his ocean in a bottle, to explain underwater complexity. Specifically, how layers interact in stratified waters. As he swishes the flask, the oil and water interface in the center roils and storms. The top remains perfectly still.

"Currents and layers below the surface can be very complex," Meadows says, explaining that a better understanding of these dynamics can help predict how oil would migrate in water. "This is particularly important in places like the Straits of Mackinac where two large bodies of water are contending for equilibrium with each other—it creates complicated and constantly shifting current patterns."

Flows within the Straits could greatly affect a spill and what shores might be impacted. Meadows heads



Guy Meadows, Director of the Great Lakes Research Center

**"CARBON-BASED FUELS AREN'T GOING ANYWHERE ANYTIME SOON. SO, WE'RE WORKING TO MITIGATE THE RISKS IN THE GREAT LAKES."**

The Straits of Mackinac are one of the most heavily traveled parts of the Great Lakes and are affected by complex currents and water column mixing.



## GREAT LAKES RESEARCH CENTER

Most scientists have to go to the Arctic to study under-ice acoustics. Not here. With the Keweenaw Waterway on its doorstep, the GLRC provides year-round research opportunities. That includes RV *Agassiz*, other surface and underwater vehicles, teaching labs, specialized research facilities, and interdisciplinary collaboration.

The building itself is built to LEED silver standards—with several green roofs—and has an innovative design. The shape, building materials, and colors are all inspired by Lake Superior. Come check it out the next time you're in town.

up a team at the GLRC that monitors these currents along with several field sites. They use buoys, remote operated vehicles (ROVs), autonomous underwater vehicles (AUVs), and sonar. The field observations are complemented—and even driven by—cutting-edge modeling using the in-house supercomputer *Superior*.

### MODELING MOTION

For the GLRC team, work by Pengfei Xue, an assistant professor of civil and environmental engineering, is the research's keystone. He studies coupled hydrodynamic and climate models to provide insight into potential oil spills.

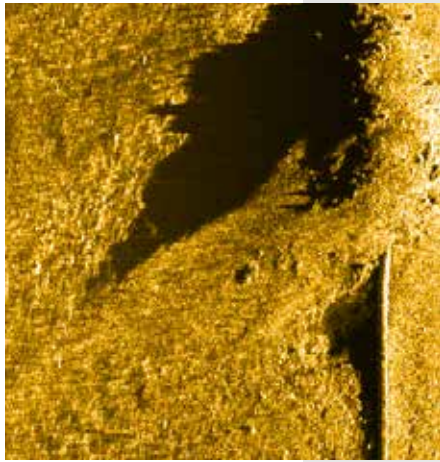
"Basically, we are trying to understand the movement of microparticles in water," Xue explains. "If we look at continuous and varying water flow patterns through space and in time, then we can predict where the particles will move."

The basis of hydrodynamic models is the set of mathematical equations that describe the motion of fluids with the conservation of water mass and momentum and energy. Using these numerical models, which are so intricate they require a supercomputer to run, Xue can address complex problems like oil spills.

To start, Xue inputs data on lake shoreline, water depth, wind field, wave height, temperature, and many other variables in the model. Then he makes meaning of the raw information using the *Superior* supercomputer and provides a 3-D simulation of water flow conditions. The end result is a visualization of the relationships of water flow, thermal structure, and wind, showing impacted area, duration, and strength if oil would disperse through an area. It's like a pointillist painting: the individual dots and data blur together, revealing a whole picture.



Lakebottom sediments pile over a pipeline; researchers use remote operated vehicles and autonomous underwater vehicles to monitor nearby terrain.



Since models are approximate mathematical descriptions of real phenomena, though, the challenge is getting enough dots of just the right color with just the right placement to blend into a realistic whole.

“Observational data is usually intermittent,” Xue says. “Modeling helps us develop continuous data points to get a clearer picture of what’s happening.”

Xue’s hydrodynamic model for the Great Lakes is detailed. So detailed that it is more like a pixelated digital photograph than a pointillist painting. It adopts an unstructured-grid finite volume approach and has the capability of resolving the lakes’ geometrical complexities with sufficient detail to determine the flow conditions at previously unprecedented resolution both horizontally and vertically. This level of hydrodynamic predictive capacity is critical for understanding hydrodynamics and its impact on our ecosystem.

In addition to microparticle modeling, another part of the GLRC’s work focuses on the microscale.

### OIL-EATING MICROBES

At the interface of oil and water, a bunch of microbes serve up an unlikely meal. In an oil spill, bioremediation calls for the *Alcanivorax*, *Neptunomonas*, *Oleispiras*, and *Oceanospirillales* groups—except there aren’t any of

these ocean-dwellers in the Great Lakes. Biologist Steve Techtmann is on a mission to find local, freshwater oil-eating microbes and understand their preferred environments.

“We need an ecosystem view on clean-up and mitigating oil spills is really an exercise in microbial ecology,” Techtmann says, adding that knowing the type of oil involved, proximity to shore, current patterns, nutrient limitations as well as seasonal variations can all impact microbes’ effectiveness.

However, he says there is no “magical spray” of oil-chompers that miraculously clears up a spill. Knowing how many oil-eating microbes are naturally present, how they interact with oil, and their potential side effects are crucial for successful mitigation.

“Oil is a complex contaminant—that’s where the biology comes in,” Techtmann says, adding that these microbes are difficult to grow and study in the lab. “Since no one has really looked at the freshwater species, we have the chance to figure out who are the dominant players in these systems.”

Again, Xue’s models can help predict and provide insight into the most likely locations of these oil-eating microbial communities. And the models depend on data validated by a vast network of buoys in the Great Lakes.

### BIG DATA

The buoys are bright yellow, about 16-feet tall from base to the top wind gauge, weigh about 600 pounds, and can manage 30-foot waves. These big buoys provide big data.

“We have more than 30 years of data and we are starting to see some preliminary trends,” says Caryn Murray, an undergraduate research assistant who has spent the past year crunching data from the Great Lakes Research Center buoys as well as National Oceanic and Atmospheric Administration buoys. “The experience has taught me the value of having lots and lots of data, covering many years.”

Murray is digging back into buoy data starting in the 1980s, focusing on Lake Superior. Today, each buoy makes a cell phone call every 10 minutes, relaying data from May to October.

One particular buoy, deployed in the Straits of Mackinac, is a key data collector. In partnership with energy company Enbridge, the buoy monitors water quality and conditions in the Straits to provide safety alerts for boaters, environmental data, and to monitors the region near Enbridge’s Line 5 pipeline. Below water, the collaboration continues with bottom sonar surveys of the pipeline and surrounding terrain. Companies are required to do pipeline inspections at least once every five years; with the buoys, ROVs, and AUVs, Enbridge and the GLRC team, led by Meadows, are able to gather observations every month.

“Any type of infrastructure needs monitoring,” Meadows says. “No one wants an oil spill, but we need to prepare for a worse-case scenario—and we’re leading the research to mitigate that risk.”



Caryn Murray, Undergraduate Research Assistant at Great Lakes Research Center

“THERE IS SO MUCH DATA AVAILABLE AND I APPRECIATE THE CHALLENGE—AND FUN—OF TRYING TO PUT IT IN CONTEXT AS AN ENVIRONMENTAL ENGINEERING STUDENT.”

# FAMILY TAKES



## SUMO MULBAH

Sumo '05 is an electrical engineer at Caterpillar's Large Power System Division.

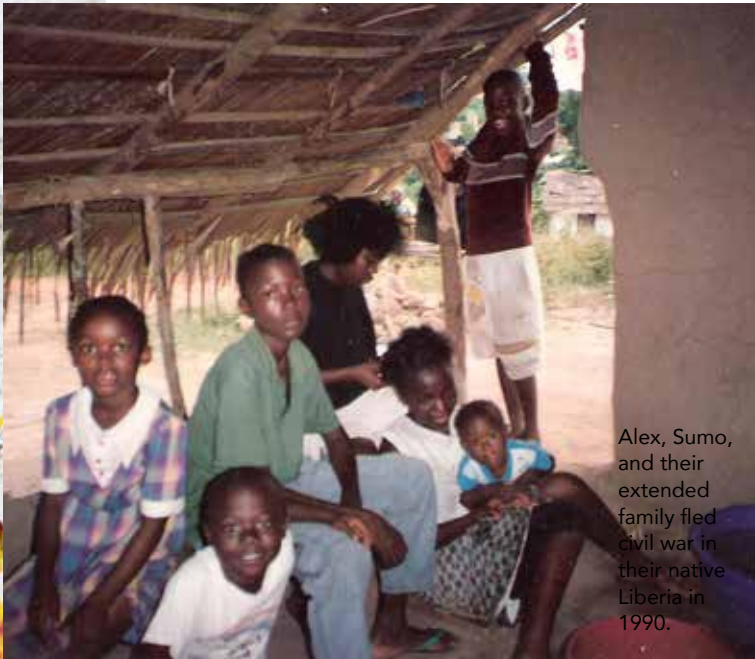
# FLIGHT



## ALEX MULBAH

Alex '03 is a lead flight test engineer at Boeing—working on the 787 Dreamliner.

Imagine starting sixth grade, like Alex Mulbah—or third grade, like his little brother, Sumo—and a few weeks into the semester, watching your world turn lethal. That was Alex and Sumo Mulbah's life in 1990, when the civil war that broke out in their native Liberia in 1989 reached their town, and they had to flee for their lives.



Alex, Sumo, and their extended family fled civil war in their native Liberia in 1990.



From the small city of Kakata, a half-hour's drive from the Liberian capital of Monrovia, the boys fled on foot through the rubble and devastation of numerous cities and villages, finally crossing the border to Guinea with their two sisters, an aunt and uncle, and four cousins. From Guinea they moved on to neighboring Ivory Coast. They had to leave their mother behind in Liberia and lost track of her after they got to Ivory Coast.

Luckily for the brothers, their father, Larwuson Mulbah was already in the US, teaching math at Davis Aerospace Technical High School in Detroit. But reuniting with his children proved a challenge and a half. He had to upgrade his green card status to full US citizenship. Then he had to prove to the US Immigration Service and the State Department that Alex, Sumo, and their sisters were his biological children. Since the family had lost contact with their mother, proof of the children's parenthood or citizenship was that much harder.

**“I was very determined to bring them to save their lives and education,” says Larwuson. “It was necessary to bring them here to safeguard their lives from a senseless civil war in a war-ravished country.”**

State Department officials wanted to interview the Mulbah children before granting them visas. Ghana agreed to host the interviews, then recanted because the youngsters had never lived in Ghana. Ivory Coast said they could be interviewed at the US Embassy there, but by then the State Department had issued all the documents to conduct the interviews in Ghana.

After the State Department prepared new documents for Ivory Coast, their father ran into yet another barrier. Ivory Coast is a French-speaking country. Liberians speak English. “We had to carry a translator from ministry to ministry to get all the right signatures,” the elder Mulbah recalls.

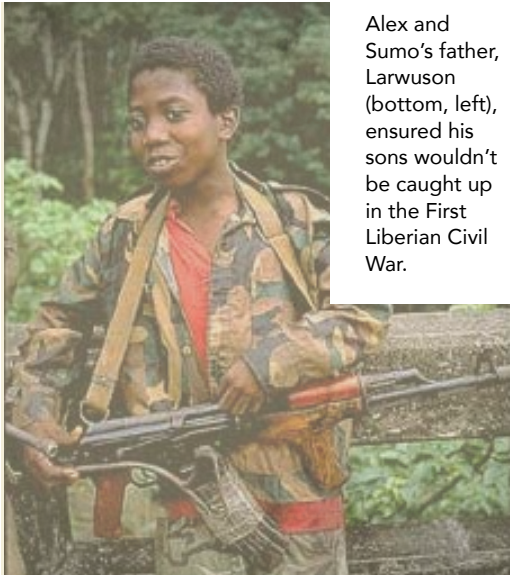
After all that, the visas were granted. Then their father had to purchase new plane tickets—a costly business with two boys and their two sisters flying—because the process had taken so long that the first set of tickets he purchased had expired.

“I was very determined to bring them to save their lives and education,” says Larwuson. “It was necessary to bring them here to safeguard their lives from a senseless civil war in a war-ravished country. Secondly, to provide them the fatherly guidance and leadership they needed, and thirdly, to share my love with them and enjoy the pleasure of watching them grow as young men and women.”

So the brothers and their two sisters came to Detroit and returned to school. Although they spoke English, their accents made it hard for their classmates to understand them, and they endured more than their share of teasing. “The accent was ammo for students at school and the community to poke fun at me, which was very unpleasant,” Sumo recalls. Alex agrees. “At times I wished I wasn’t in school because of the bullying, both in school and on the school bus.”

Clothes became another issue. In Liberia, the boys wore uniforms to school. “In Michigan, kids would always tease me because I didn’t have the latest fashions,” Alex remembers.

The schoolwork was also challenging. “I had not been in a classroom for four years, so there was a lot of catching up for me,” Alex explains. “I did well with my sciences, but I struggled with my grammar and reading.” The boys’ father and their uncle, a professor at the University of Toledo, worked with them to prepare them to succeed in their



Alex and Sumo's father, Larwuson (bottom, left), ensured his sons wouldn't be caught up in the First Liberian Civil War.



Detroit classrooms. "My father gave us math problems to solve, and my uncle had us reading newspaper articles and summarizing them to him," Alex recalls.

Both boys wound up in a math, science, and applied technology program in high school that hooked them on engineering. "Michigan Tech wasn't even on my radar initially," Alex notes. Then he found out that one of his uncles had gone to Tech, and he began researching the school. "I learned that it is one of the top engineering schools," he says. "I also found out that it is well known in many large companies because of the great work many alumni before me have accomplished." When it came time for Sumo to go to college, he followed his brother's example, majoring in electrical engineering at Michigan Tech.

They knew that Tech was 500 miles from Detroit, but they didn't know how far that could seem in the cold and snow of a UP winter. "My brother and I had our adventures traveling from Houghton to Detroit during the winter and having our car break down several times," Alex recalls. "That was not fun at all."

But he also remembers "how helpful my peers, instructors, and TAs were."

They graduated—Alex in 2003 with a mechanical engineering degree and Sumo in 2005 with a degree in electrical engineering—and landed jobs with the Boeing Company and Caterpillar Inc. Alex, who lives in Renton, Washington, is now a lead engineer in flight test engineering instrumentation operations for Boeing. Sumo is an electrical engineer in control systems design for engines and generator sets in the Large Power System Division at Caterpillar. He lives in McDonough, Georgia, near Atlanta.

Diego Bernal, who works with Alex at Boeing, thinks the world of his colleague. "Working with Alex is like working with a brother that you can count on all the time," says Bernal. "He is not only responsible and dedicated, but also he is funny and with a good spirit: he can make you get a good laugh. Something that I appreciate about him is his integrity. You know what to expect from him."

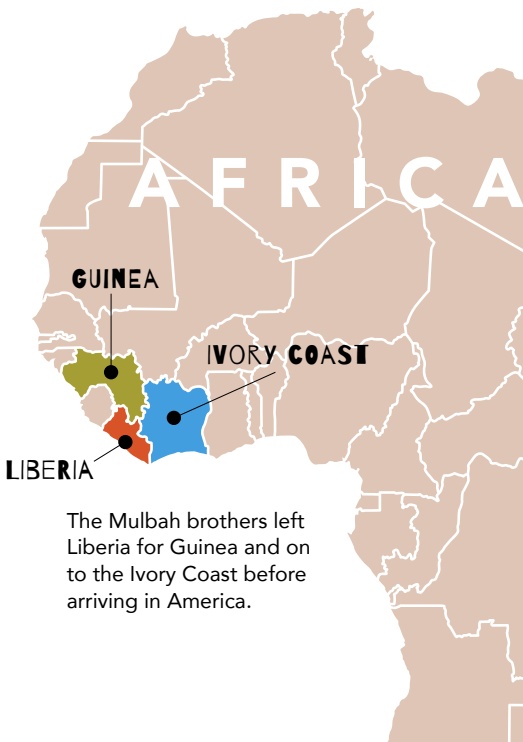
Both Alex and Sumo have hopes for the future of their native land. "I hope for a government that would care for its people," says Sumo. "I hope Liberia's vast natural resources can be used for the prosperity of its people." Alex adds, "My hope for Liberia and the Liberian people is that we always love one another and be united again—never to let what happened during 14 years of civil war happen again."

Sumo sums it up: "I hope the beautiful people of Liberia can rise and smile again."

From a war-torn childhood to an engineering education at Michigan Tech to successful careers with international corporations, Alex and Sumo Mulbah have turned unimaginable obstacles into Michigan Tech success stories.

Their father knows how far they have come. "It is very difficult to describe my joy and the gratitude I owe to God when I realize that these children came from a country where thousands died and millions were displaced, received guidance from me, their father, as a single parent, and their uncle, followed such guidance against all odds and succeeded where many would have failed," he says.

**"My brother and I had our adventures traveling from Houghton to Detroit during the winter and having our car break down several times."**



The Mulbah brothers left Liberia for Guinea and on to the Ivory Coast before arriving in America.



Appleton to Zeeland. Chassell to Chile. Huskies are crafting better beer through chemistry. Better wine through engineering.

**F**or some, it's a retirement gig, like Dan Schmidt, '71, a minority owner in St. Paul Minnesota's **Flat Earth Brewing Company**. For others, like Travis Prueter '06 and Nicholas Winsemius '06, two of a three-engineer partnership at **Big Lake Brewing** of Holland, Michigan, it's the start of a

boundless future with standards of excellence "committed in the spirit of engineers."

We found more than two dozen alumni tapped into the \$22.3 billion craft-beer market. Six winemakers with Michigan Tech roots as well-tended as their vineyards. A

hops exchange. A cidery. A distillery. And trail-blazing microbiologist Emily Geiger '11 '15, who sells liquid yeast cultures to Michigan breweries and around the world.

## MEET THE BREW CREWS

The craft-beer market is growing faster than a field of rye in springtime—16 percent in 2015. Of the Top 50 breweries of 2015, 43 are craft brewing companies. What's behind the spike? Millennials demand choice. "You always want to bring that unique beer that no one else has to the party," says Mairi Fogle '09, who along with husband Ben '08, Carl Pierce '08, and Evan Zaborski '10, created **Appleton Beer Factory**, ripping out nail-by-nail and repurposing wood and windows in a 1940s downtown auto-parts shop. "We saved everything," says Mairi. "We designed and built the whole thing ourselves. The engineering advantage." Mairi says a Michigan Tech marketing and management education also factors in the factory's success. "The entrepreneurial drive, plus the soft skills we learned here—the confidence we can do something."

Across Lake Michigan in Zeeland, another wife-husband entrepreneurial team, Laura and Nate Gentry '05, transformed an historic downtown building into a community-minded brewery. At **Tripelroot**, sustainable is a verb. Stainless steel growlers instead of glass. Spent grains used in stonebreads and cookies. Pot-bellied pigs Minnie and Pigby feast on food scraps.

Nate's Michigan Tech experience included bartending at *The Library*, the legendary watering hole now-brewery owned by late-'70s Tech students Jim and Deb Cortwright. He's not the only one who's turned a shift behind a Keweenaw bar.

Dick and Stasi Gray '82, of Houghton's own **Keweenaw Brewing Company** have hired more than 90 Michigan Tech students since their doors opened in 2004. The eighth-largest craft brew distributor in Michigan produced 10,000 barrels last year.

"One of the primary reasons I started brewing after leaving Tech was I couldn't find any beer that matched the quality of KBC," says Ken Brooks '10. "So I decided to do it myself."

**"One of the primary reasons I started brewing after leaving Tech was I couldn't find any beer that matched the quality of KBC."**

**Ken Brooks**  
Brooks Brewery

There's another Tech alumnus at the helm of family-owned Detroit-area **Brooks Brewery**—Brother Rob '11—and a Husky Stout on the menu.

"The brewery affords Rob and I a chance to use our engineering skills in unique ways," says Ken, who continues to brew at home, too, as do many Tech alumni. Like Sonny Christian '97. "My beginnings into this hobby started at Tech," says the **Genessee Brewers Club** member. "After I turned 21, of course!"

And there's a pair of Tech alumni to fill that need, too. Katie and Ryan Gray '07, whose careers have taken them from western oil fields home to the Upper Peninsula, where Ryan becomes the second generation of Grays to expand the brewery business. In spring 2016 they cut the ribbon at **Electric Brewing Supply**, in the Einerlei building in Chassell. The business launched four years ago in Texas.

"We got our feet wet when it was still new," says Ryan. "Most everybody is growing by double digits. A whole lot of young people are into home brewing."

Katie, a geologist, wonders if her department can still be found tipping back a post-study coldy at KBC. "Like we used to," she says.

Farther east, proof positive that Huskies and Wildcats can brew in harmony: **Ore Dock Brewing Company** of Marquette, with co-founders Wes Pernsteiner '02 and Wade DePas '03 on the owner roster.

Chris Nowak '86 hasn't quit his 25-year day job in the chemical industry. "I leave all the technical aspects to our brewmaster," says the partner in **Tri-City Brewing Company** of Bay City. "However, I am fortunate to be able to sample many of our beers prior to market release! The great thing about getting an engineering degree from Tech is that it opens doors to many career choices, some more typical of true engineering disciplines and others utilizing problem-solving and people skills developed at Michigan Tech."

## ALUMNI BREWERIES



**FLAT EARTH BREWING CO.**  
Saint Paul, Minnesota  
Dan Schmidt '71



**BIG LAKE BREWING**  
Holland, Michigan  
Travis Prueter '06  
Nicholas Winsemius '06



**APPLETON BEER FACTORY**  
Appleton, Wisconsin  
Ben '08 and Mairi Fogle '09  
Carl Pierce '08  
Evan Zaborski '10



**TRIPLEROOT**  
Zeeland, Michigan  
Nate and Laura Gentry '05



**KEWEENAW BREWING COMPANY**  
Houghton, Michigan  
Dick and Stasi Gray '82



**BROOKS BREWERY**  
Shelby Township, Michigan  
Ken Brooks '10  
Rob Brooks '11



**ORE DOCK BREWING COMPANY**  
Marquette, Michigan  
Wes Pernsteiner '02  
Wade DePas '03

There's a corporate secret at **Schmohz Brewery** of Grand Rapids: Chas Thompson '91 refuses to disclose the origin of the name. But Husky Spirit is loud and clear. All investors, staff, and management are alumni including head brewer Gabi Palmer '89, owners Jim '87 and Laurie Schwerin '87, and their son Luke '16. "We host the West Michigan Alumni Association chapter here on the last Thursday of the month. I think we are the most active chapter outside of the Copper Country."



**ELECTRIC BREWING SUPPLY**  
Chassell, Michigan  
Ryan and Katie Gray '07



**TRI-CITY BREWING COMPANY**  
Bay City, Michigan  
Chris Nowak '86



**SCHMOHZ BREWERY**  
Grand Rapids, Michigan  
Jim '87 and Laurie Schwerin '87  
Luke Schwerin '16  
Gabi Palmer '89  
Chas Thompson '91



**THE LIBRARY**  
Houghton, Michigan  
Jon Davis '59  
Jim and Deb Cortwright '80s



**GRAND RIVER DISTILLERY AND BREWERY**  
Jackson, Michigan  
John Burtka '70s



Tom Porter, owner of Porter Family Vineyards, and Dave House, owner of House Family Vineyards and partner in Mountain Winery, talk shop at the KBC.

## THE GRAPEVINE

"And my parents thought I was wasting my time 'studying' at The Library," says Mark Lienau '90 of **Silver Leaf Vineyard & Winery** in Suttons Bay and **Old Mission Hops Exchange**, near Traverse City, Michigan. **Villa Mari Vineyards** is 25 miles down the bay. Proprietor and UP native Marty Lagina '77 co-stars in the History Channel series "The Curse of Oak Island."



**"I took an engineering approach when I planted my vineyard."**

**Dave House**  
House Family Vineyards

the 115-year-old Paul Masson vineyards.

Tom Porter '68 and Dave House '65 are California neighbors with vineyards two hours apart. "He's Napa, I'm Santa Cruz," says Dave, also a partner in **Mountain Winery**, today's incarnation of



Tom Porter and family at the Porter Family Vineyards.

## ALUMNI WINERIES



**SILVER LEAF VINEYARD & WINERY**  
Suttons Bay, Michigan  
Mark Lienau '90



**VILLA MARI VINEYARDS**  
Traverse City, Michigan  
Marty Lagina '77



"I took an engineering approach when I planted my vineyard," says House. "I hired a team of PhDs." Science-based precision farming—solar-powered weather stations, petiole analysis, separate drip systems to treat individual plants—are balanced by a low-touch approach to wine-making. "We let the grapes express themselves."

California is also the distribution center for the oldest Michigan Tech winery connection. When Carl John Kingston graduated from Michigan College of Mines in 1906, he left his Central Mine home in Keweenaw to seek South American gold. He never found it, but the farm he established five generations ago is home to **Kingston Family Vineyards** in Chile's Casablanca Valley.

It was a daring move in the pre-Model T, pre-Panama Canal days. Great granddaughter Courtney Kingston says "Gramps" was encouraged to take the uncommon path by his advisor, Metallurgy and Ore Dressing Instructor Durward Copeland, known in family lore as "Copes."

## BEER & WINE: BLURRED LINES

"It takes a lot of beer to make a great wine," says Tom Porter of **Porter Family Vineyard**. His beer creds are as solid as his red-wine affinity. "I did all the electrical wiring for Jon Davis '59 before The Library opened. And worked there as a bartender."

Yeast also unites Husky beer and wine makers. You can't make either without it. Emily Geiger, co-owner

**"I've been in this business a long time. Way before it was cool."**

**Phillip Kelm  
Gitche Gumee  
Brewery Services**

of **Craft Cultures** in Hancock, got her start as KBC staff microbiologist "They asked me 'could you propagate yeast?' It took eight months to optimize the process. Once I did, I saw the value in the product. There were

no yeast companies east of the Mississippi River in 2013, when I started. I saw the need, especially with Michigan being the great beer state."

Craft Cultures cultivates indigenous Michigan bacterial strains.

"Everyone's in love with that, because right now everyone wants to brew with all-Michigan all locally sourced ingredients. It's a hot topic."

And then there's the beer whisperer. Craft Cultures and other breweries work with pro-brewer, data collector, competition advisor and judge, and troubleshooter Erik Hansen '07, creator of one of the first electric brewing systems.

## MILLING AND DISTILLING

Late-1970s Michigan Tech student John Burtka operates an American-made electrically heated copper column still at **Grand River Distillery and Brewery**—Jackson, Michigan's first legal liquor. He's also co-owner with wife Denise of **Cherry Creek Winery & Cidery**. President and

Mrs. Obama served their wines to Oprah Winfrey and Stedman Graham just prior to moving into the White House. And to delegations at the NATO summit.

"I've been in this business a long time. Way before it was cool," says Phillip Kelm '87 of **Gitche Gumee Brewery Services**. A world-wide

workload includes Keweenaw, India, and Korea cideries, Hand and Malt Brewery in Korea, and managing a Micronesian brewery.

"I worked in nuclear power right out of Tech, but that wasn't enough of a challenge. I took a segue into brewing in 1993. Never looked back. I'm able to use my education as a mechanical engineer with energy systems option to great effect in my current work. Brewing beer is very much a thermodynamic process with lots of other mechanical equipment and systems working together. That might be why Tech graduates excel at it."



Emily Geiger '11 '15  
Co-owner of  
Craft Cultures  
Hancock, Michigan



Watch video interviews with our brewmasters and vintners at:  
[mtu.edu/beer/wine](http://mtu.edu/beer/wine)

**"It takes a lot of beer to make great wine,"**

**Tom Porter  
Porter Family  
Vineyards**



**CHERRY CREEK  
WINERY & CIDERY**  
Brooklyn, Michigan  
John Burtka '70s



**KINGSTON  
FAMILY VINEYARDS**  
Casablanca, Chile  
Carl John Kingston 1906



**PORTER FAMILY  
VINEYARDS**  
Napa, California  
Tom Porter '68



**HOUSE FAMILY  
VINEYARDS**  
Santa Cruz, California  
Dave House '65

# 90 years of Huskies

When Alyssa Smith graduated from Michigan Tech with a master's degree in civil engineering in December 2015, she did more than receive a diploma. She wrote another chapter in a family history that began nearly 90 years ago.

In the years before the Great Depression, Paul began an educational tradition that his son, daughter-in-law, two grandchildren, and two great-grandchildren would follow.

of a small population of women up at Tech, and so she had to show all the boys up in academics, which she did." Priscilla was a member of Tau Beta Pi and Sigma Gamma Epsilon.

Priscilla recalled the gratifying feeling of being the only woman in the geological engineering department, yet having the highest GPA. Even though she left campus in 1965, before earning her degree, she did return 18 years later to complete her degree in geological engineering.

Paul Young (center) with his 1935 Wright Hargreaves Mining Company basketball team. Young was the first of four generations to attend Tech.

"There I was, in 1983, traipsing through the woods with the 'youngsters' to take the final class I needed to get my geological degree from Michigan Tech," Priscilla says. One of those youngsters just happened to be her daughter Leora.



Smith is the latest member of her family to attend Michigan Tech, an odyssey spanning four generations. She is also the third generation of female Tech graduates. Alyssa earned her undergraduate degree in 2014 and her older brother Kealy received a degree in computer and electrical engineering in spring 2015.

The sibling's family journey began in 1927 when their great-grandfather, Paul Edgar Young, left the University of Toronto and came to Houghton to attend the Michigan College of Mines. He earned a bachelor's degree in mining engineering and won three varsity letters in basketball and was a member of Theta Tau fraternity.

Young's son, Michael, attended Tech from 1961 to 1965 and, like his father before him, majored in mining engineering. Young was also a member of Tau Beta Pi, Sigma Gamma Epsilon, and Blue Key.

It was at Michigan Tech that Michael Young met Priscilla Mae Schaffer, a geology major who would become his wife. Michael and Priscilla live in Portage, Wisconsin, where Michael still consults in the mining industry.

Priscilla Young's tales of her days in Houghton would influence her granddaughter decades later.

"My Nana would always talk about Tech when I was younger," Alyssa Smith said. "She would talk about how she was one

Priscilla and Michael's daughter, Leora, became the third generation of Youngs to attend Michigan Tech in 1984, majoring in medical technology. Like her father and grandfather before her, Leora embraced Greek life, joining Alpha Xi Zeta. She also experienced another historical aspect of life at Tech, broomball. She said she was one of the first females to work with flooding and upkeep on the outdoor broomball rink.

A year after she arrived at Tech, Leora was joined by her brother David Young, an electrical engineering major. However it was another man who provided her with her fondest Tech memory.

"Walking across that stage to receive my diploma with my husband, both of us



with honors, was a special memory," Leora Smith says.

Alyssa Smith (second from left) pictured with her parents and grandfather—all Tech grads.

Leora and Brett live in Iron Mountain where Brett is in mining/manufacturing, and her brother David is a sales manager for Great Northern forestry products in Elk Mound, Wisconsin. He started at Michigan Tech as an electrical engineering major but moved to management.

With her family history entwined with Michigan Tech, it is no wonder that Alyssa Smith says her career path and education choice were determined pretty early on.

"When I was in middle school, I already knew what I wanted to do—design buildings," she says. "I decided to go into civil engineering. Michigan Tech was the obvious choice."

Kealy also had an obvious choice in terms of his major, "I have always had a love for anything electronic." When it came to choosing a college the answer was clear. After one semester he added the electrical engineering major.

Alyssa is currently living and working in St. Paul while her brother is working in Grand Rapids. Both are planning weddings in the near future—both to Tech alumni.

So there it is, the latest chapter in the Michigan Tech saga of the Youngs and Smiths, but it might be best to leave the book open. It may be a couple of decades away, but there's no telling how many great, great grandkids will be Huskies.

## Pirate Sheep Sweep

### Alumni-Student Broomball Invitational



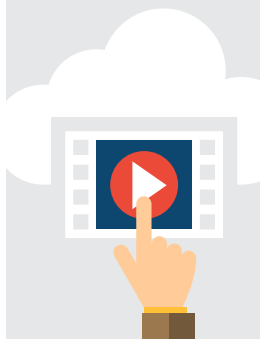
The 2016 Alumni-Student Broomball Invitational tournament over Winter Carnival brought together a record number of participants.

Thirteen teams with more than 100 students, alumni, and friends with players ranging from the class of 1975 to the class of 2018 battled for the Alumni Cup.

Congratulations to the tournament champions, alumni team Pirate Sheep!

Tournament photos and a video of the championship game can be found here: [mtu.edu/alumni/favorites/broomball](http://mtu.edu/alumni/favorites/broomball).

Participants in Alumni-Student Broomball Invitational left it all on the ice.



Next winter, don't forget to check out **Michigan Tech's webcams** featuring each of the three broomball rinks in all of their high-definition, competitive glory: [broomball.mtu.edu/info/webcams](http://broomball.mtu.edu/info/webcams).

From the Alumni Association

# Outdoor Adventure Program celebrates a decade

By kayak, paddleboard, canoe, skis, and snowshoes, Michigan Tech's Outdoor Adventure Program (OAP) provides excursions and equipment rentals for faculty, staff, and community. Created in 2006 with support from Charles J. Nelson '36 and Patricia Nelson, the program gets Huskies out enjoying Keweenaw Peninsula's trails, woods, and waters.

OAP started in the Memorial Union Building with one staff and five student-staff members. Today, original leader Jared Johnson is still director, assisted by a 25-student staff.

In 2010, OAP moved to O'Connor House on US 41. Outreach continues through guided trips, leadership training, and working with Michigan Tech's many student organizations, from the cycling crew to the International Club. Find maps, the latest weather forecast, even reflective gear for nighttime adventures.

OAP also rents camping equipment. "We can get alumni set up with most things they need. They are able to rent from us just like a current student," notes Johnson.

Breakers to Bridge is coming this fall. "Since OAP is 10 years old we are doing a large, timed paddle event that is 10 miles in length," he says.

Contact OAP at 906-487-2290 or [oap@mtu.edu](mailto:oap@mtu.edu). Find them on Facebook, or on Instagram (@mtu\_adventure).

It started as an idea and has grown into a Tech institution. OAP is 10 year's old and getting better with age.



# 10 TOP

## Ten ways you can be a resource for Michigan Tech and our students:

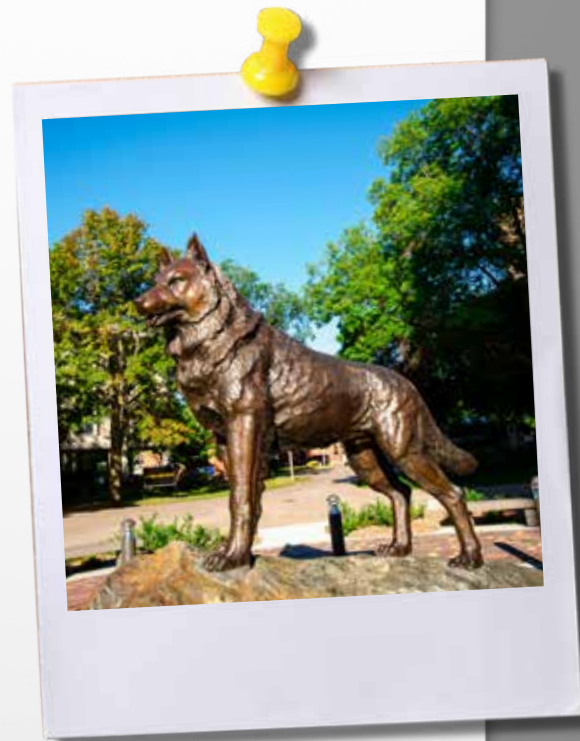


Michigan Tech

Our alumni are our most valuable and vital resource. Whether it's your time, talents, or treasure, every contribution is significant.

Here's how you can help:

- 1 Talk about your Michigan Tech experience with friends, coworkers, children, and grandchildren. As successful professionals, alumni are our best recruiters!
- 2 Support the Annual Fund. Every gift counts!
- 3 Network with fellow Huskies—attend chapter events in your area.
- 4 Share your professional experience with current Michigan Tech students in the LinkedIn Alumni-Student Professional Networking group.
- 5 Stay involved—follow and interact with us on social media.
- 6 Follow and interact with us at [facebook.com/MichiganTechAlumniAssociation](https://www.facebook.com/MichiganTechAlumniAssociation) or [@mtualum](https://www.instagram.com/mtualum).
- 7 Help us recognize outstanding alumni and friends of Michigan Tech through our awards program.
- 8 Stay connected—when you see “906” calling, pick up the phone and learn what's new on campus from our student callers.
- 9 Give your ride a touch of Husky with a Michigan Tech license plate.
- 10 Get your company involved through sponsored research projects, matching gifts, internships, corporate chapters, student organization sponsorships, or Career Fair participation.

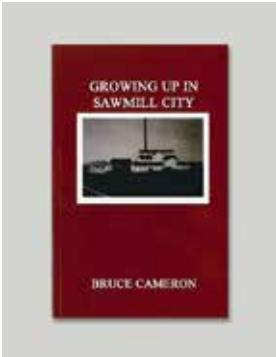


## Have a unique skill or area of interest?

Let's explore potential opportunities to be of service to a department, program, student organization, or your class, local, or corporate chapter. Contact Alumni Engagement at [alumni@mtu.edu](mailto:alumni@mtu.edu) or call 1-877-688-2586.

# Class Notes

## 1950s



**Bruce Cameron '58** (non-degree) is a retired teacher who recently wrote a book about his childhood home of Trout Creek titled *Growing up in Sawmill City*. A remarkable history of the Upper Peninsula from the 1930s to the present.

**Merle Potter '58 '61** (Mechanical Engineering) has written *Thermodynamics for Engineers*, his 34th engineering related book, eight of which are textbooks along with engineering-help books and exam-review books. He is the self-proclaimed most prolific engineering book writer. He taught at Michigan Tech 1957-61, the U of M 1961-65 and MSU 1965-98.

## 1970s

**John Lendel '71** (Electrical Engineering) retired from active employment as senior vice president MW Industries, Inc. after 10 years of employment. MW Industries (MWI) headquartered in Rosemont, Illinois, is the largest and most diversified

specialty spring and fastener manufacturer in the United States.

**Greg Bouse '74** (Metallurgical and Materials Engineering) has recently retired from his position as principal engineer casting technology for General Electric Power Systems of Greenville, South Carolina. He lives in Hart, Michigan.

**Gene Pesola '74** (Biological Sciences) obtained a PhD in Epidemiology from Columbia University in May 2015. He currently is a pulmonary/critical care physician at Harlem Hospital, affiliated with Columbia University in the City of New York and has been involved with clinical research for many years. His PhD thesis focused on Dipstick Proteinuria and Dyspnea as Predictors of Mortality in rural Bangladesh.

## 1980s

**Stephen Kusnit '80** (Biological Sciences) is the Lead Implementation Project Manager for HireGenics. HireGenics is focused on customer success and delivers workforce risk mitigation and talent optimization solutions to global enterprises.



**John Cabaniss '81** (Mechanical Engineering) was recently admitted to the State Bar of Arizona and has opened an office in Phoenix. He will also continue to maintain an office in Milwaukee, Wisconsin, and will focus on plaintiff's legal malpractice and personal injury cases in both locations.

**Margaret Pinkava Liubakka '86** (Medical Technology) is a System Analyst for MCL Computer Services in Ypsilanti, Michigan.

**David Ellis '88** (Electrical Engineering) was named President of Skidmore Pump in Grand Rapids, Michigan, in November 2015. Prior to this appointment David was the chief operating officer of Concept Industries for nine years and spent more than a decade at Johnson Controls/Prince Corporation in a variety of management roles with increasing leadership responsibility. He is an Eagle Scout and a vice president of district operations for the President Ford Council. He and his wife, Michelle, live in Holland, Michigan, and are the proud parents of four children, Michael, Monica, Emily, and Eileen.

**Stacey (Roehm) Keener '88** (Computer Science) earned her GSEC (cyber security essentials) certification silver from Global Information Assurance Certification (GIAC) October 9, 2015.



**Colonel Peter Moutsatson '88** (Mechanical Engineering) recently retired from the US Air Force after 27 years of service. At his retirement ceremony in June 2015 he was awarded the Defense Superior Service Medal for his accomplishments during his final assignment with the Defense Security Cooperation Agency. He has accepted a position as vice president, business development with Textron Systems based in Washington, DC.

**Mike Renier '89** (Chemistry) is currently engaged in community service projects in South Range, Michigan, and Adams Township. He volunteers at Little Brothers Friends of the Elderly holiday dinners, contributes to Holy Family Church food fundraisers, coordinates fundraising for the annual 4th of July celebration and serves as secretary assistant for the Range Lions Club. Last year he also donated science books to the public library at Jeffers High School.

## 1990s



**Douglas Leisenring '91** (Mathematics) was named the Superintendent of Delta-Schoolcraft Intermediate School District July 1, 2015. He was recognized as the 2015 Michigan High School Principal of the Year by the Michigan Association of Secondary School Principals. He and his wife, Becki, traveled to Washington, DC, where he received his award from the National Association of Secondary School Principals (NASSP).

**Peter Elzinga '92** (Civil Engineering) and Laura Elzinga are happy to announce the birth of their son, Tripp Robert, born July 14, 2015.



**VeRonica Mitchell '93** (Chemical Engineering) Senior Engineer, Vehicle Definition and Balance, General Motors, received

a Modern Day Technology Award at the 2016 BEYA Science, Technology, Engineering, and Math (STEM) Conference. VeRonica is recognized for the work she has accomplished at GM, and for the impact she has had on the automotive industry in creating new opportunities for women and minorities. She was also elected as deputy mayor of Auburn Hills, Michigan.

**Douglas Coffman '94** (Chemical Engineering) After being co-owner of a digital marketing agency for 10 years, Doug became a digital marketing strategist with FindLaw, a part of Thomson Reuters in November 2014. He manages a portfolio of clients including the website, PPC, and off-site optimization. He stays current with the ever-changing Internet landscape and works closely with clients to understand their marketing objectives and strategies, analyze the performance of their entire web program, and recommend tactics that will help them realize their goals. He lives in the Keweenaw area.

**Jeremy Florence '94** (Mechanical Engineering) has been promoted to chief program manager at Ford Motor Company, Dearborn, Michigan. He resides in Canton with his wife and five children.

**Akemi (Johnson) Mitchell '95** (Chemical Engineering) is now the senior vice president, Quality/Continuous Improvement for the Public Lighting Authority of Detroit. Akemi and her husband, **Anthony Mitchell '96** (Mechanical Engineering), reside in Livonia, Michigan.



**Mark Zivkovich '99** (Business Administration) was recently named Scotttrade's top performing manager in the nation and earned their President's Club Award for providing excellent client service and support.

## 2000s



**Rebecca Heckman '00** (Biological Sciences) In summer 2015, she studied model community-based efforts to preserve Bornean species along the Kinabatangan River in Sabah (East Malaysia) on the island of Borneo. Rebecca, the virtual academy coordinator at Inland Lakes Schools in Indian River, Michigan, took the graduate course in pursuit of her master's degree from Miami University's Global Field Program.



**Matthew Dina '02** (Civil Engineering) completed a Masters of Business Administration (MBA) degree from the University of California, Davis Graduate School of Management June 13, 2015. "I married the woman of my dreams September 19, 2015 in South Lake Tahoe, California, surrounded by our family and friends."



Burke Abbott Kesti was born to **Kelly (Abbott) Kesti '04 '05** (Business Administration, Biological Sciences) and Steven Kesti January 17, 2016. Mom is already hoping he'll be a Husky some day!



**Frank Lloyd Mathias '05** and **Jody Lynn Kositzky '01** (Chemical Engineering) were married October 10, 2015, in front of family and friends at Greenmead Historic Park. They reside in Livonia, Michigan, with their two Dobermans.

**Shannon Pedit '05** (Civil Engineering) and Darrell Ford are excited to announce their latest addition to the family. Joel Conrad Ford was born October 20, 2015, and is excited to be a future Husky.



**Matthew Barkley '06 '10** (Mechanical Engineering) was married to Alisa Orrin of Troy, Michigan, September 5, 2015, in Rochester Hills, Michigan, and they currently reside in Troy, Michigan.



**Hans Korth '08** (Mechanical Engineering) and **Nora (Peterson) Korth '10** (Environmental Engineering) are overjoyed to announce the birth of their daughter, Adrienne Rose, September 18, 2015, at Eglin AFB, Florida.



**Pamela Brushaber '09** (Civil Engineering ) and **Tyler Fincher '11** (Civil Engineering ) were married September 12, 2015 in their beloved Houghton, Michigan, at Grace United Methodist Church. The two met during an international senior design trip to Panama and were both involved in Engineers Without Borders. Their wedding party was full of Tech grads and their decorations were in the spirit of the Copper Country. The couple currently live and work in Minneapolis, Minnesota.

## 2010s

**Victoria Peters '10** (Communications and Culture Studies) and **John Butler '08** (Environmental Engineering) own Copper Pasty, a small business that brings the UP to Bremerton, Washington. Victoria learned how to make pasties from her grandmother in Calumet, Michigan, before moving out to Seattle almost four years ago. Since graduating, John has been working for the United States Public Health Service.



**Brian '11** (Electrical Engineering) and **Jessica Thompson '12** (Biological Sciences) welcomed their first daughter, Lily Grace, February 9, 2016.

**Kiri Kennedy '14** (Wildlife Ecology and Management) is a high school biology teacher in the Apple Valley Unified School District in Apple Valley, California.



**Nathaniel Schulz '14** (Civil Engineering) and **Anna Vanderkooi '14** (Environmental Engineering) were married August 9, 2015. Anna is employed by Fleis & VandenBrink Engineering and Nate is employed by Comprehensive Engineering. The couple resides in Lowell, Michigan.

# Alumni Reunion August 4-6, 2016

Come See Your Michigan Tech Family—and Bring Yours



Pasty Picnic, Tech Talks, hearty breakfasts, Portage Canal cruises—we've arranged for all your Reunion favorites, plus some fun, new, family activities.

**5K Run/Walk sponsored by Keweenaw Alumni and Friends Chapter**

**Make your own huggable Husky**

**Pasty-making demonstration and tasting**

**Tour a 47-foot US Coast Guard Station**

**Portage motor lifeboat**

**Paddleboard, canoe, kayak**

And don't miss the second annual Keweenaw Science and Engineering Festival (KSEF) Wednesday, August 3 through Saturday, August 6. KSEF is an all-age geek extravaganza to spark excitement about science, technology, engineering, and math, skills that help our families and our world. The line-up includes Family Engineering Day, Science Pub Crawl, and a Michigan Tech Mind Trekkers Expo. For final schedule and registration information, visit [mtu.edu/reunion](http://mtu.edu/reunion).



# Q & A

**Jim '81 (Civil Engineering) and Shawn '82 (Computer Science) Rathbun left Tech after graduation, returning years later after careers, kids (all Tech grads), and a once-in-a-lifetime gap year took them across the US on a tandem bike.**

**Q. What are your best memories of your time at Tech?**

Jim/Shawn: Meeting new friends and falling in love. Looking out the window of East Coed Hall (now McNair) and seeing the beautiful fall colors and the Portage and being amazed to be able to live in such a beautiful place!

**Q. What were you involved in while you were students?**

Jim: I split my time between studying, working, and hanging out in the TV lounge.

Shawn: Homecoming activities like root beer chugging! Winter Carnival activities especially speedskating—my 1st place trophies were still in the trophy case at McNair last time I looked! Intramural sports—a big reason why I came to Tech was because they had women's intramural ice hockey! And it wasn't no-check the way women's hockey is now!

**Q. What did you do after you left campus?**

Jim: I was in construction project management and facility engineering.

Shawn: I've been a computer software developer, project manager, and consultant.

Together we raised three children who are all graduates of Tech: Aimee '05 civil engineering, Walt '08 geological engineering, and Matt '12 computer engineering and computer science (double major).

**Q. What are you doing now?**

Jim: I am working as a facilities engineer in the facilities management department at Tech.

Shawn: I work remotely doing part-time consulting work.

**Q. What motivated you to return to the Copper Country?**

In spring 2014, we quit our jobs to take a cross-country trip on our tandem bicycle. Our three month pedaling adventure from Bar Harbor, Maine, to Anacortes, Washington, was the trip of a lifetime! After the trip, we wandered the Pacific Northwest by bike as we awaited the birth of our first grandchild. Once we welcomed sweet little Paxton James Rathbun into the world, we kept up the nomadic life. We took the ferry to Alaska, Amtrak back to Michigan, and then flew to Europe with our backpacks and Eurail passes. Our "gap year" was

a year to remember, but then it was time to get jobs again. Shawn's former employer asked her to come back and



then offered her remote work once Jim secured his job at Tech. We had always dreamed of returning to the Copper Country and are once again gazing out our window at the Portage, thrilled to be living in such a beautiful place!

**Q. What are the best things about living and working here?**

The warm, friendly people, and the simple life—walking to work, the Aurora Borealis, Lake Superior, fishing, the snow—seriously!

# In Memoriam

## 1938

David G. Jig

## 1940

Robert W. Rost

## 1941

Raymond Lampsa

## 1942

Loren E. Howard

## 1943

Robert D. Allen

Keith E. Fluegel  
John H. Kline  
Edward R. Krebs  
Vincent K. Litwinowicz  
Clifford McMann Jr.  
Joseph M. Post  
Richard C. Witte  
Jack A. Wohlfeil

## 1951

Roger V. Carter  
Prof. James A. Johnson  
Urho A. Lehtikoinen  
Henry J. Lombard

Thomas A. Kirby  
Dr. Ernie V. Luoma

## 1955

Ralph L. Baker  
Dr. Thomas J. Herron  
Donald W. Lahti  
Ronald J. Maloney  
John F. Muller

## 1956

Marvin J. Carr  
James F. Erspamer  
George Kotonias  
Lt. Col. Richard E. Moffitt (Ret)  
Prof. Duane M. Thayer  
Roger B. Van Omen

## 1957

James N. Chaffee  
James E. Colligan Jr.  
Philip T. Foltz  
Oiva R. Harju  
Howard B. Johnson  
John H. Lee  
Richard J. Madison  
John N. Nilsen  
James A. Pozzo

## 1958

David E. Cole  
Jerome B. Knaebel

## 1959

William A. Longacre  
Quentin F. Ruonavaara  
William H. Sliger

## 1960

Roland B. Burgan  
Daniel F. Herringa  
Donald C. Larson  
Michael M. K. McCrank  
Douglas J. McDonald  
Thomas H. Nakanishi  
Walfred K. Ponnikas  
Gerald D. Van Voorhis  
Leonard A. Zandi Jr.

## 1961

William D. Carmody  
Carl E. DeWald  
Lee A. Kinney, PE  
James R. Pruner  
Donald E. Randall  
David H. Sawyer  
Raynold A. Svenson

## 1962

Donald P. Kesti  
George A. Mitchell  
Michael C. Trebilcock

Albert J. Veteri, PE  
Eugene M. Weitz

## 1963

Peter K. Caylor  
Thomas A. Weir

## 1964

George J. Diem  
Harry E. Hardy  
Patricia A. O'Hagan  
William W. Torrey, PE

## 1965

Robert O. Hopkins  
Terry M. Johnson

## 1966

Albert E. Fountain  
J. Frederick Ian Murray  
William P. Oswald  
Ernest L. Spear

## 1967

Bienvenido T. Capul Jr.  
Michael P. Healy

## 1968

Roger H. Cope  
Dale J. Roberto

## 1969

David A. Switzer

## 1970

Dr. David F. Bergman  
David S. Kemmer  
Michael R. Morin

## 1971

Charles H. Austin

## 1972

David E. Siirtola  
Mark A. Wooster

## 1973

Dennis P. Massoglia  
Bruce E. Michaelson  
Karen P. Mitchell

## 1974

Gary W. Bopra  
Gary H. Brusso  
Greg P. Doucette  
Stephen W. Nicholls

## 1975

David M. Korhonen  
Douglas E. LeClaire  
Keith J. Lewis  
Russell A. Napp  
Lyle D. Wheelock

## 1976

Patricia J. Dalessandro

## 1977

Kathryn L. Brown  
Dr. David J. Lucas

## 1978

Kenneth A. Maki  
Robert J. Olszewski

## 1979

David H. Cook

## 1980

Stephen J. Frankovich  
Richard D. Scherer

## 1982

Arthur P. Judnich  
Ronald F. Simonick

## 1983

Nicholas Geiermann

## 1985

Timothy S. Etelamaki  
William A. Schoneman

## 1987

Eugene F. Hammond

## 1990

Charles W. Frederick III

## 1991

Michael G. Chronowski

## 1994

Clarence J. Puska Jr.

## 1996

Cheryl L. Johnson

## 1998

Christopher R. Sullivan

## 2004

Renee G. Marion

## 2005

Beth A. Blumhardt

## 2010

John D. Kinney

## 2016

Benjamin C. Kobane



Woods on  
Mont Ripley  
October 7,  
2015.

## 1944

Marie G. Sawyer  
Dr. Robert K. Vander Yacht

## 1947

Dr. Donald E. Dawson  
Robert F. Scott

## 1948

Betty L. Clark  
Roscoe G. Marah  
Henry J. Pellikka  
Rodney P. Roehm

## 1949

John J. Donnelly  
William T. Moore  
William E. Ward  
Francis C. Wilson

## 1950

Richard M. Berry

Roger D. Lopez  
Andrew N. Peterson  
John A. Ridan, PE  
John H. Smith

## 1952

Thomas R. Carlson  
Robert J. Gustafson  
Donald J. Messner

## 1953

Prof. Gordon E. Frantti  
Alan J. Fritz  
William T. Kaarlela  
Kenneth J. Karppi  
Ronald Leonard Laity, PE

## 1954

Robert J. Cochrane  
Robert Frank Cooper  
Donald King Cunningham  
Rev. Robert W. Dundon, S.J.



"I plan to continue my education after graduation and pursue a master's degree. Thanks to you, I am one step closer to that goal."

Kristen

"I'm so excited to take these classes and continue my education. It wouldn't be possible without scholarship help."

Jamie

**Your support helps our students create the future.**



"Generosity like yours has helped make my Michigan Tech experience possible. I hope to support young scholars in the same way someday."

Kerwin



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