2019

2019 Civil and Environmental Engineering Department News

Department of Civil and Environmental Engineering, Michigan Technological University

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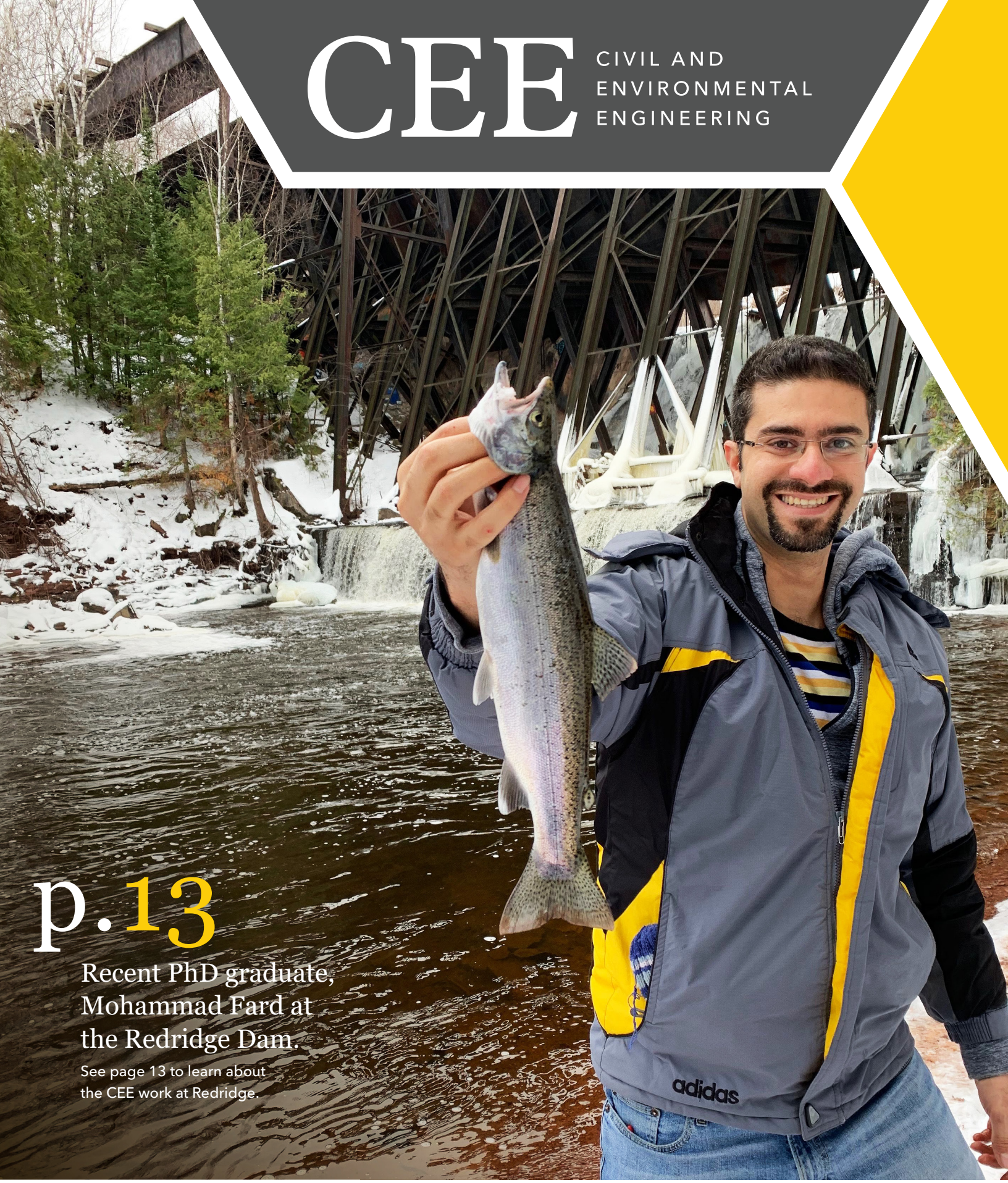
CIVIL AND ENVIRONMENTAL ENGINEERING



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Recent PhD graduate, Mohammad Fard at the Redridge Dam.

See page 13 to learn about the CEE work at Redridge.

Michigan Technological University
1885

SPRING 2019 DEPARTMENT NEWS

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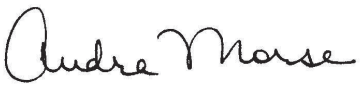
Greetings from Houghton!

Can you believe it? Another year has passed and we are pleased to share the highlights and accomplishments of the students, alumni, faculty, and staff of the Michigan Tech Civil and Environmental Engineering Department. Inside this newsletter you will find first-hand examples of how we, as the Civil and Environmental Engineering Department, provide an educational, professional, and intellectual experience that enables a diverse body of students, alumni, faculty, and staff to contribute to society through teaching, research, practice, and service. We have much to celebrate and we are pleased to share these accomplishments with you.

Of course, 2018 was a year we will not forget due to the Father's Day flood. We received many well wishes from our alumni–thank you. And true to the Michigan Tech Husky Spirit, we are using the damage caused by the flood to strengthen our educational and research programs. Although the campus, the town, and the local communities are still working to repair the damage created from the floods, we the faculty, staff, and students have and continue to give our talents to help local communities rebuild after the flood.

To continue the spirit of giving thanks, I personally want to thank our alumni and friends who promote Michigan Tech and the Civil and Environmental Engineering programs. Maybe you wear your favorite Michigan Tech sweatshirt on Saturdays while running errands (keep reading–we have an offer you can't refuse). Maybe you and your company hire civil and environmental engineering graduates. Maybe you've encouraged a high school student to apply to our degree programs or even come up for a prospective student visit. All of these are great ways to promote the school and our programs and for your time, energy and effort we are grateful. We know that word of mouth is invaluable so thank you for sharing your husky pride wherever you are and to whomever you are speaking.



Audra Morse, PhD, PE, BCEE
Professor and Department Chair

MISSION

The Department of Civil and Environmental Engineering provides an educational, professional, and intellectual experience that enables a diverse body of students, alumni, faculty, and staff to contribute to society through teaching, research, practice, and service.

VISION

The Department of Civil and Environmental Engineering will develop internationally prominent educational and research programs that will benefit all of its constituencies and, in doing so, will become an international Department of Choice.

DIVERSITY

To further the Department's mission of teaching, research, and service, the Department strives to be diverse, inclusive, and respectful of all staff, faculty, and students in support of the University's Diversity Statement. The goal of this statement is to ensure everyone will be given equitable support, opportunity, and access to resources necessary to realize individual potential while contributing to the success of the Department.

Department Statistics

40%
Women Undergrads

#1

College Factual lists **Environmental** as the #1 school in Michigan and #7 in the US.

600
Enrolled Students

College Factual lists **Civil Engineering** as the #1 school in Michigan & #16 in the US.

$5.6M
External Sponsored Funding

GUIDING PRINCIPLES

We will continually work to engage our students, faculty, and staff in the integration, creation, and dissemination of knowledge through teamwork, personalized instruction, research, and outreach. We will value diversity. We will measure our success by the success of our graduates and by the growth in the department's prestige.

CEEPAC Civil & Environmental Engineering Professional Advisory Committee

Donald Anderson, PE	AnLaan Corporation (retired)
Michelle Banonis, Esq.	California Department of Water Resources
Dennis Decator, PE, PMP	DTE Energy
Randall Gardner, PE	Westwood Professional Services
James Keighley	VP of Engineering, Kraft Foods (retired)
Sean Kelley, PE, MBA	The Mannik & Smith Group, Inc.
Leslie Nelson, PE	GZA GeoEnvironmental Inc.
Leanne Panduren, PE	Rowe Professional Services
Dean Roberts	General Motors
Teresa Schissler-Boichot, PE	Challenge Manufacturing Company
Timothy Wellert, PE	Northern Industrial Construction, Inc.
Kim Zimmer, PE	MDOT

Presidential Council of Alumnae–2018 Inductees

Michigan Technological University Presidential Council of Alumnae (PCA) members are recognized for personal and professional achievements in all facets of life, including education and career excellence and community involvement/volunteerism and current/previous relationship with Michigan Tech. Members meet annually on campus for activities that support the University's Strategic Plan and focus on specific tasks at the request of the President.

PCA Members

Tess M. Ahlborn, PhD, PE
Christine Morris Anderson
Michelle L. Banonis
Jennifer G. Becker, PhD
Elzbieta G. Berak, PhD
Debra A. Campbell
Mary Elizabeth Coburn, PE
Michelle E. Eggert (Jarvie), PhD, PE
Kristina Fields, PhD
Raine Gardner, PE
Katherine R. King
Kristine M. Krause
Debra S. Larson, PhD, PE
Catherine A. Leslie
Kathryn D. Lynnes
Kerry E. Sutton Maloney, PE
Emily McDonald
Kimberly K. Nowack
Brenda J. O'Brien
Leanne Homberg Panduren, PE
Linda D. Phillips, PE
Teresa M. Schissler-Boichot, PE
Beverly A. Siersma
Christine M. Sloat
Sheryl A. Sorby, PhD
Amy L. Trahey, PE
Jane L. Waldron

Raine Gardner

Raine graduated from Michigan Tech in 2005 with her bachelor's degree in civil engineering. She then went on to earn her master's degree in civil engineering from the University of Wisconsin-Madison. She is currently a Senior Project Engineer at MSA Professional Services, Inc. where she manages and engineers municipal and park/recreation projects. Raine is a member of MSA's Professional Services' Board of Directors and is a parks and recreation practice leader.

Raine is a current member of the American Society of Civil Engineers, a Wisconsin Parks and Recreation Association Member, and a National Recreations and Parks Association Member. In October, Raine received the 2018 American Council of Engineering Consultant's Young Professional of the Year Award in Las Vegas.

As an alumna, Raine remains involved on campus. She has spoken in the Civil Engineering department's professional practice classes every semester on Work/Life Balance and engineering as a career. She has also presented to the American Society of Civil Engineers on "Working as an Engineer in the consulting industry." She also recruits for her company at Michigan Tech's career fair.

Raine is married to Randy Gardner '03 '04, who graduated from Michigan Tech with his bachelor's and master's in environmental engineering. They live in Baraboo, Wisconsin with their two children.

Kristina Fields

Kristina graduated from Michigan Tech in 1996, 1998 and 2006, with her bachelor's, master's, and PhD in civil engineering. She currently works as a professor of Civil and Environmental Engineering at the University of Wisconsin-Platteville. She is in charge of teaching civil and environmental engineering courses, advising students, developing/hosting STEM outreach activities, and is an advisor for the student chapter of the Institute of Transportation Engineers.

Kristina has received multiple awards including the UW-Platteville Nimocks' Family Faculty Appreciation Award, the Outstanding Academic Advisor Award, and the UW-Platteville Award for Excellence in Service Learning. Kristina currently leads a study abroad program course throughout the Netherlands that explores bicycling infrastructure, which two Michigan Tech students have attended.

She is an active member of the Institute of Transportation Engineers, the Center for Infrastructure Transformation and Education, and the American Society of Civil Engineers. In her community, Kristina is a club volleyball coach, a sponsor for the organization African Soul American heart, and is chair of the Platteville Community Safe Routes Committee.

Kristina lives in Platteville, Wisconsin with her husband Paul Fields, a 1996 Civil Engineering alumnus, and their two kids, Michael and Emily.

Emily McDonald

Emily graduated from Michigan Tech in 2012 with her bachelor's in environmental engineering. She is currently working on a master's in business administration at Wayne State University. She works as a Senior Environmental Engineer at General Motors where she provides waste management expertise and support to the General Motors Flint Complex.

Emily has represented General Motors as a panelist at the Wildlife Habitat Council International Symposium. In 2015, she had the opportunity to travel to Nairobi, Kenya, and Egypt to train and prepare environmental engineers for environmental audits. She is also the GM Women Employee Resource Group secretary.

Emily is a member of Engineers without Borders and the Michigan Association of Hazardous Materials Professionals. She is a Project GREEN Mentor, a Greening of Detroit Citizen Forester, and is a Regional Alumnae Coordinator for the Alpha Gamma Delta Volunteer Service Team.

As an alumna, Emily stays involved as the Vice President of the Michigan Tech Alumni Board of Directors, a GM recruiter at career Fair, and a host of Third Thursday socials for the Metro Detroit Area.

Service Award

This new award was created to recognize a CEE undergraduate that has shown exemplary service through student organizations or groups affiliated with the Department. The award is accompanied by a $500 scholarship.

THE NOMINEES:

- Heidi Anderson nominated by Kris Mattila for her efforts with the Student Success Center.
- Sara Beine nominated by David Watkins for her efforts with Engineers Without Borders.
- Meredith Brehob nominated by Noel Urban for her work with The Society for Environmental Engineers.

Meredith Brehob was selected for the 2018 Service Award. Meredith graduated in May with her environmental engineering degree. She was active in the Society for Environmental Engineers for all four years at Michigan Tech. In the past year as President of SEEn, Meredith orchestrated an impressive list of service and outreach activities including: recycling initiatives, World Water Day involvement, and assisting with the Western UP Science Fair. She has actively sought to expand the numbers of students involved with service at the Department, University, and community level.

Graduate Teaching Assistant of the Year

The CEE Department has a number of dedicated graduate students that assist faculty with classes as Graduate Teaching Assistants. The hard work that they put in to the classes and labs is noticed and appreciated.

Emily Shaw was voted the 2018 Graduate Teaching Assistant of the Year by CEE students. Emily is an environmental engineering doctoral student in the Department.

Danielle Ladwig Award for Graduate Excellence

This award is made annually to a graduate level student in civil or environmental engineering in recognition of outstanding achievement in academics, research, and service, in memory of our friend and colleague, Danielle Ladwig. This award is accompanied by the Pat Damoder and Soumitri Reddy $1000 endowed fellowship.

Mohammad Alizadeh Fard was selected for the 2018 award and was nominated by his advisor Brian Barkdoll. Mohammad graduated with his PhD in December 2018. He was involved with Graduate Student Government, served as a graduate teaching assistant and a mentor in the CEE Student Success Center, played on the CEE Department intramural soccer team, and was active in publishing several papers in the completion of his degree. Mohammad is also interested in the outdoors and fishing–he is pictured on the cover of this newsletter.

Nicole Bloom Award for Environmental Sustainability

This award was developed in 2006 and is made annually to an undergraduate civil or environmental engineering student who has demonstrated leadership, passion, and activism for effecting environmental sustainability at the local, national, or global level. The award is dedicated in honor of Nicole Bloom, an outstanding Civil and Environmental Engineering Department graduate. This award is accompanied by the Pat Damoder and Soumitri Reddy $1000 undergraduate scholarship.

The 2018 Nicole Bloom Award went to **Emma Hitch**. Emma is from Menominee, Michigan and graduated in May with her environmental engineering degree. Like Nicole Bloom, she has displayed a similar passion for the environment, and has been actively engaged in efforts to improve the environment and awareness of minimalist lifestyles while at Michigan Tech through involvement with the Green Campus Enterprise.

Department Scholar

Each year CEE selects one of our highest achieving students to be considered for the University Scholar Award.

Rose Turner was selected as the 2018 Civil and Environmental Engineering Department Scholar. Rose graduated in December 2018 with a degree in environmental engineering. She collaborated on Dr. Daisuke Minakata's research during the 2017-18 academic year through the Portage Health Fellowship. She maintained a 4.0 GPA in addition to serving in several leadership positions in the 'Alternative Energy Enterprise' and the 'Sustainable Demonstration House Team.'

CEE Recognized for Safety Efforts

The Office of Environmental Health and Safety announced the first of two inaugural Excellence in Safety awards for the 2019 academic year.

This year's academic recipient is the Civil and Environmental Engineering Department. CEE is being recognized for the efforts of its Laboratory Safety and Chemical Hygiene Committee. The committee, comprised of Stan Vitton, Chris Wojick, Dave Perram, Lisa Cunard, Kiko de Melo e Silva, Jake Hiller, and Noel Urban, worked to become campus leaders in both online training and self-inspection. The committee developed a training matrix that matches specific lab hazards to training titles in the PureSafety system, and was one of the first departments to adopt the SafetyStratus system for department-level lab inspections.

(L-R) DR. KUILIN ZHANG, SHUAIDONG ZHAO, SUAICHENG GUO, DR. BARBARA DAI, DR. AUDRA MORSE

Wilbur Haas Graduate Research Excellence Award

The Wilbur Haas Graduate Research Excellence Award is made annually to a graduate level student in civil or environmental engineering to recognize outstanding student scholarship and research contributions. This award is accompanied by a $1000 departmental fellowship.

This year two doctoral students were selected to receive the 2018 Wilbur Haas Graduate Research Excellence Award.

Shuaicheng Guo recently completed his civil engineering doctoral degree. He was nominated by his advisor Dr. Barbara Dai.

Shuaidong Zhao is working towards a civil engineering doctoral degree. He was nominated by his advisor Dr. Kuilin Zhang.

Citizenship Award

Stan Vitton was recognized with the inaugural Department Citizenship Award. This new award recognizes a faculty member that 'goes the extra mile' whether it be in representing the Department, helping colleagues, or participating at events.

Howard E. Hill Award

The 2018 Howard E. Hill Outstanding Faculty of the Year Award recognized a faculty from each of our department degree programs. **Dr. Kris Mattila** was voted the top civil engineering faculty and **Dr. Eric Seagren** was voted the top environmental engineering faculty. The Howard E. Hill Award, which recognizes excellence and passion for teaching, was established in 1994, and is determined annually by the CEE students.

(L-R) DR. KRIS MATTILA, DR. ERIC SEAGREN, CHRISTINE WOOD

mParks Community Service Award

Joan Chadde is a recipient of a mParks Community Service Award by the Michigan Recreation and Parks Association (mParks).

The awards recognize individuals and groups who show outstanding support to public recreation and park programs in their community.

This award was specifically for her initiative in designing and implementing a one-week summer program, now in its fourth year, to bring 20 under-represented students from high schools in Detroit to explore environmental science and engineering majors and career paths at Michigan Tech.

The mParks award recognizes Chadde's fundraising efforts in covering costs for all students' and exploration leaders' transportation, their housing and meals, the recruitment and selection of students, and the program planning, evaluation, and publicity.

Chadde, a staff member of the Department of Civil and Environmental Engineering, is the director of the Center for Science and Environmental Outreach and an adjunct instructor in the Department of Cognitive and Learning Sciences.

2017 Best Paper Award for Dai & Sun

Dr. Qingli (Barbara) Dai and her former PhD student, **Xiao Sun** (first author) along with Mechanical Engineering faculty, Dr. Fernando Ponta and ME graduate student, Muraleekrishnan Menom have been selected to receive the 2017 Best Paper Award of ASCE Journal of Aerospace Engineering (JAE).

The award will be received at the awards banquet of the 2018 Earth and Space Conference, held in Cleveland, Ohio in April for their paper "Design and Simulation of Active External Trailing-Edge Flaps for Wind Turbine Blades on Load Reduction" by Xiao Sun, Qingli Dai, Muraleekrishnan Menon, and Fernando Ponta: https://doi.org/10.1061/(ASCE)AS.1943-5525.0000771. The research done for this paper was funded by the National Science Foundation (NSF).

Michigan Sea Grant

Since invading the Great Lakes, filter-feeding zebra and quagga mussels have brought increased water clarity to lakes Michigan, Huron, and Ontario. This has boosted the growth of bottom-dwelling filamentous algae like Cladophora, which washes ashore in stringy green mats to foul beaches and harbor harmful bacteria. The invading mussels also recycle phosphorus – a nutrient that feeds algal growth – through their feces. **Pengfei Xue,** an assistant professor in the Michigan Technological University Department of Civil and Environmental Engineering, will lead a team building computer models to simulate how wave and current patterns influence the distribution of mussel-boosted phosphorus levels. They will investigate how that cycle affects Cladophora growth near Sleeping Bear Dunes and Grand Traverse Bay.

The Princess & the Water Treatment Problem

Our new mass spec examines various chemical samples at much finer resolution that ever before. Water treatment processes greatly benefit from the mass spectrometer's analyses.

In the United States, more than 130 million chemicals are registered with the American Chemical Society, and roughly a few thousand of them are in daily use. However, the US Environmental Protection Agency regulates a fraction of that–about 60 organic compounds.

Chemicals are ubiquitous in this country. Have a headache? Take ibuprofen. There are many chemicals in cosmetics. Agriculture operations use herbicides and pesticides. And many of these chemicals one way or another end up in our waterways.

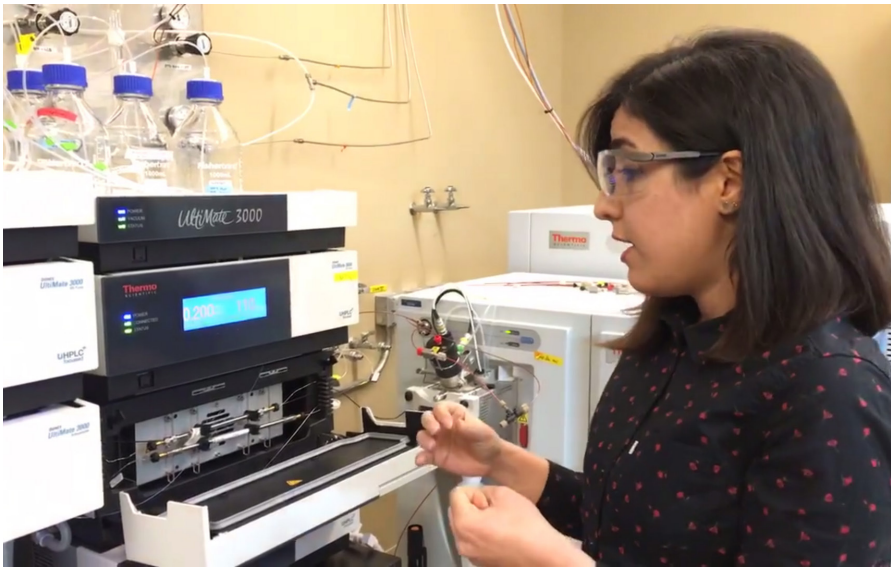
Enter "the Princess". That's the affectionate nickname of Michigan Tech's Ultrahigh Resolution Hybrid Ion Trap Orbitrap Mass Spectrometer (Orbitrap Elite), which is housed in the Chemical Advanced Resolution Methods Lab (ChARM) in the Great Lakes Research Center. The Princess is capable of parsing through the millions of chemical species within a given sample, separating mass peaks so that researchers can identify them. The level of differentiation the mass spectrometer is capable of also gives researchers high confidence in their results.

Which is good, because some of the most challenging problems today–on land, in the water, and in the air–require first identifying which chemicals are present, even in the tiniest amounts.

DISSOLVED ORGANIC MATTER INTERFERES WITH WATER TREATMENT

The Princess has contributed to one such project that could help future wastewater treatment plants become more successful at treating water.

In a new paper published in the journal Water Research (DOI: 10.1016/j.watres.2018.02.015), Michigan Tech researchers discussed the transformations of dissolved organic matter in water when exposed to ultraviolet (UV) and UV-based advanced oxidation processes (AOPs). These interactions include UV/hydrogen peroxide (UV/H2O2), UV/free chlorine and UV/persulfate.



Without the Orbitrap Elite's capabilities, such a deep analysis of the molecular transformations would not have been possible. But why are these transformations important in the first place? Simply put, the presence of dissolved organic matter interferes with the water treatment process.

"Wastewater treatment technology is primarily used to remove trace organic contaminants such as pharmaceuticals, personal care products, pesticides and herbicides from wastewater effluent to reduce the negative impact to ecological systems and natural aquatic environments such as the Great Lakes," says Daisuke Minakata, assistant professor of civil and environmental engineering and corresponding author on the paper. "However, the presence of background dissolved organic matter is detrimental to the efficient removal of these trace chemicals."

Many water treatment plants were designed in the 1950s and 1960s, and they were not designed to effectively remove chemicals common today, the majority of which are not biodegradable. Consequently, trace concentrations of those chemicals are present in effluent–the water discharged from the treatment plants into lakes, rivers and streams. Although found in extremely small concentrations, just nanogram or micrograms, the toxicity is not well understood in human bodies and ecosystems.

If the water treatment plants are busy targeting dissolved organic matter rather than trace chemicals, they aren't doing their job. And unfortunately, water pollution is a growing problem globally.

MASS SPECTROMETRY OFFERS INSIGHT INTO BETTER WATER TREATMENT

"Water is a non-renewable resource exploited all over the world; there is more pollution than remediation," says Lathika Varanasi, a doctoral candidate in environmental engineering and co-author/lead author on the study. "It's affecting the life of water."

Therefore, selecting the right kind of treatment method for a particular area's water and waste is important to maximize water plant efficiency and effectiveness. But to determine an appropriate treatment method, the water itself–and the dissolved organic materials present in all sources of water–need to be characterized.

Daisuke and Varanasi joined Maryam Khaksari, ChARM research scientist, and Lynn Mazzoleni, ChARM's co-director and associate professor of chemistry, and Erica Coscorelli, a master's degree student. Using the Orbitrap Elite, the team visualized the ways dissolved organic matter react to UV and AOPs. For the first time, the group was able to take a complex mixture of dissolved organic matter, visualize the impact of various radical species, and then evaluate the transformation.

> *"We may never know the exact properties of dissolved organic matter. But systematic investigation like this published study will help engineers select a favorable UV-based advanced oxidation processes by knowing the molecular-level properties."*
>
> DAISUKE MINAKATA

These are attractive and promising approaches for the removal of contaminants because of the high reactivity of active radical species produced by UV-AOPs with a wide variety of organic contaminants. People studied the limited properties of dissolved organic matter for decades; ultrahigh mass spectrometry is only now coming on the scene.

The Princess can detect substances far smaller than peas under mountains of mattresses. The Orbitrap Elite is ready to take on the tiny engineering challenges that create wastewater treatment conundrums.

Vitton & Mattila Support World War I Replica Trench Efforts

A collaborative project between Social Sciences, Humanities, Civil & Environmental Engineering, Visual & Performing Arts, Facilities, IT, the Michigan Tech football team, and the community to build a replica World War I firing trench was completed in September.

Stan Vitton, using sketches from WWI firing trenches, designed a trench that is historically accurate but met modern criteria. **Kris Mattila** oversaw the construction of the trench on the southeast corner of US 41 and MacInnes Drive on the Michigan Tech campus.

The replica trench was part of the centenary WW1&CC commemoration of the US in the Great War, and particularly the Copper Country's contribution to the war effort, and was the feature of an exhibit designed to offer the public a glimpse of what life might have been like for the soldiers who lived in them.

New Faculty

DR. CORY MCDONALD

Cory McDonald joined the Civil and Environmental Engineering Department as an assistant professor in January 2018. He was the Mendenhall Postdoctoral Fellow with the US Geological Survey National Research Program from 2010-2012 then served as a Research Limnologist with the Wisconsin Department of Natural Resources. He completed his PhD at Michigan Tech in 2010.

His teaching interests are surface water quality engineering and modeling, and his research focuses on aquatic ecosystems and ecologically-based approaches to water quality management.

Pipeline 5 risk assessment

Several CEE faculty participated in the Michigan Tech led Line 5 risk analysis. The research team was led by Guy Meadows, Director of the Great Lakes Research Center, and included 41 researchers.

The group conducted an independent risk analysis of the two parallel, 20-inch pipelines that form the 4.5-mile section of Enbridge's Line 5 that runs beneath the Straits of Mackinac.

In a draft report submitted in July to the State of Michigan, the team of experts evaluated the economic, environmental and cultural impacts of a "worst case scenario" spill or release from the Straits Pipelines.

Stan Vitton Works to Stabilize Redridge Dam

In the June 17 storm that caused flash flooding in many areas, the steel dam at Redridge suffered accelerated and aggravated damage and distress.

Stan Vitton, of the Civil and Environmental Engineering Department at Michigan Technological University, is now the principal investigator for stabilization project to be funded by Federal Emergency Management Agency (FEMA).

Vitton and his team have worked to monitor the dam's condition, needed repairs, and other stabilization procedures, Vrana said, and their work has been instrumental in keeping the project on the front burner since the study and restoration programs started in 2008.

DR. MELANIE KUEBER WATKINS

Melanie Watkins joined the Civil and Environmental Engineering Department as a research assistant professor in May 2018. She is working to enhance the CEE Department research initiatives and proposal development as well as supporting our teaching mission. She has over 10 years of consulting engineering experience with expertise in hydrologic and hydraulic analysis. She completed her PhD at Michigan Tech in 2013.

Top 100 Intern

Civil engineering undergraduate **Kelsey Fournier** was selected as one of WayUp's Top 100 Interns. The winners were selected by 30 percent public vote and 70 percent by a judging panel formed of human resources and industry experts. Fournier is an intern at Carmeuse Lime & Stone.

John A. Focht National Scholarship

At the Chi Epsilon national conclave in Arlington, Texas this March, CEE Environmental Engineering undergraduate student **Christine Wood** received the John A. Focht National Scholarship to help further her education at Michigan Tech. She has always felt passionate about the environment and public well-being. The Environmental Engineering program at Michigan Tech is allowing her to turn that passion into a career. Improving the relationship between humans and the environment has become Christine's primary goal. This passion is what lead her to being presented with this national award.

Christine grew up in East Lansing, MI and began her college experience at Olivet College located in south central Michigan. As part of the transfer program, she transferred to Michigan Tech in the fall of 2016 to major in environmental engineering. Christine became involved in the Pavlis Honors College, Society of Women's Engineers, and the Young Women Leaders Program at Tech. Christine is also currently involved in a research study which will serve as her honors project component titled "Reduction of Stream Erosion through Air Injection," working alongside Dr. Brian Barkdoll and PhD student, Jennie Tyrell.

Christine graduated with her BS in environmental engineering in Decemeber 2018, but plans to stay in Houghton to complete her MS in environmental engineering through Tech's accelerated master's degree program. Christine interned with the Wastewater Treatment Plant in Charlotte, MI and the Wastewater Department for Fishbeck, Thompson, Carr & Huber in Lansing, MI which both helped her realize her desire to focus on water and wastewater processing. Her ultimate goal is to work in wastewater consulting within the state of Michigan.

Braun Intertec 2017 Co-op of the Year

Environmental engineering graduate student **Kiran Udayakumar** has been selected as the Braun Intertec 2017 Co-op of the Year. In 2017, Kiran completed a six-month field testing co-op internship in the Braun Intertec Williston, North Dakota office. Operations Supervisor Jeremiah Gibson says, "Kiran's performance exceeded all expectations and he exemplifies a well-educated engineer on his way to a successful career."

Kiran quickly learned the procedures and methods for testing construction materials with an awareness to safety and best engineering practices. He was selected for OSHA 10 training so that he could work on oilfield projects, like The Dakota Access Pipeline, and highway projects, such as the Lewis and Clark Bridge, Bureau of Indian Affairs Hwy 12.

"I couldn't have done this without the constant support of my advisor and mentor Martin Auer and my mentors Sarah Bird and Darnishia Slade who gave me constant support and motivation throughout the co-op."

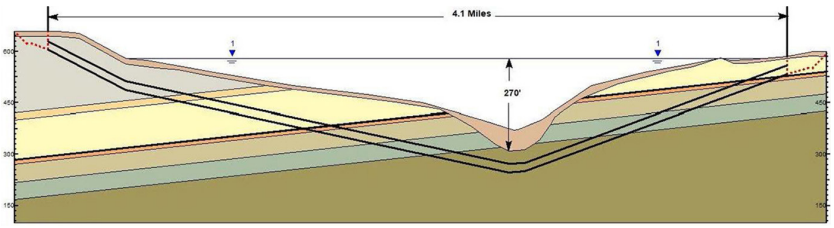
KIRAN UDAYAKUMAR

American Water Works Scholarship

Erica Coscarelli, a MS student in the environmental engineering program, has been selected to receive the 2018 Bryant L. Bench/Carollo Engineers Scholarship. The scholarship is sponsored by Carollo Engineers, an environmental engineering firm that specializes in wastewater facilities for municipalities and the public sector. Erica will be formally presented with the award at the American Water Works Association (AWWA) Annual Conference and Exposition in Las Vegas in June.

Erica's research studies the fate of organic compound degradation in the aqueous-phase advanced oxidation processes. She applies the novel computational chemistry method to predict the reactions and kinetics to predict the degradation products of emerging organic compounds.

The water treatment process is found in wastewater reclamation process for the application of direct potable reuse of treated wastewater in water scarce regions. The process can be also applied to wastewater treatment processes to mitigate the negative impact of trace organic compounds found in wastewater discharge to natural aquatic environment such as lakes and rivers.



Students Design Underground Utilities Corridor for the Straits of Mackinac

A group of Michigan Technological University seniors worked on a possible solution to protect the gas, oil, and electrical lines under the Straits of Mackinac.

Professor of Practice **Mike Drewyor** said his senior capstone project class of 16 wrapped up a semester of work examining how to build an underground tunnel beneath the straits. They presented their findings in May on what they hope could be a way to protect the Great Lakes from environmental disaster.

Chad Brown, a civil engineering major on the class's geological investigation team, said he thinks there's a good potential the tunnel could come to fruition.

> *"I think that there are so many concerns, environmental concerns for the public that they would actually like this to happen," he said. "In terms of it being economical, it could have some complications there, but in terms of preserving the beauty of the Mackinac Straits, I think it's a very good solution."*
>
> CHAD BROWN

Young Professional of the Year

MSA is proud to announce that **Raine Gardner '05,** senior project engineer for the firm, has been awarded with a 2018 Young Professional of the Year Award from the American Council of Engineering Companies (ACEC).

The award recognizes the accomplishments of young Professional Engineers (PEs) who have made significant contributions to the industry and to the greater society. Gardner was recommended by the ACEC Wisconsin chapter and is the first from the state to be recognized.

Raine holds a bachelor's degree in civil engineering from Michigan Technological University and a master's degree in civil engineering from the University of Wisconsin-Madison.

Making a Splash

Michelle Banonis '99 was appointed Assistant Chief Deputy Director of DWR (California Department of Water Resources) on May 8. She brings a wealth of knowledge and expertise from the US Bureau of Reclamation (Reclamation) Mid-Pacific Region where she spent eight years working on the Sacramento-San Joaquin Delta and Upper San Joaquin River.

> *"We are shaping the future of California's water environment."*
> MICHELLE BANONIS '99

Born in Cleveland, Ohio, Michelle spent most of her early years in Michigan. She earned a bachelor of science degree in environmental engineering in 1999 from Michigan Technological University and in 2015 earned a Juris Doctor degree from Humphreys College, Laurence Drivon School of Law.

President of ACEC/M

Michigan Tech alumnus **Sean Kelly '86** was recently selected as president of the American Council of Engineering Companies of Michigan (ACEC/M). the story, "ACEC Of Michigan Elects New President And Board Of Directors," appeared on the Detroit Regional Chamber website.

He received his BSCE from Michigan Technological University and his MBA from Eastern Michigan University and is a registered professional engineer in Michigan and Ohio.

President of NSPE-MI

Scott Conners, PE, '92 will serve as the President of NSPE-MI, the National Society of Professional Engineers in Michigan.

Scott has a bachelor of science degree in civil engineering and holds many certifications related to municipal government. He has been the city engineer in Walker for the last 20 years, after having worked as a consultant for eight years with a variety of clients and projects across west Michigan. Scott previously served as Western Regional Vice President for MSPE and Western Chapter President, and currently serves as the chairman of the Professional Engineers in Government statewide committee.

He is a member of the American Society of Civil Engineers, the Grand Valley Metro Council, the Grand Rapids Charter Township Planning Commission and Site Plan Review Committee, and many other organizations. In addition to the bachelor of science degree, he holds a master's degree in organizational management from the University of Phoenix.

In 2017 Scott won the Michigan Engineer of the Year Award from NSPE-MI. He is described as a dedicated, hardworking engineer, outstanding in professional abilities and endless willingness to volunteer. He is well respected among his peers with esteemed reputation for leadership.

STEP Ahead Emerging Leader

The Manufacturing Institute announced that **Breanna Cornell '14,** Process Engineer at the Essity (formerly SCA) Bellemont, AZ paper converting site, is a recipient of the Women in Manufacturing STEP (Science, Technology, Engineering, and Production) Ahead Emerging Leader Award.

The STEP Ahead Awards honor women who have demonstrated excellence and leadership in their careers and represent all levels of the manufacturing industry, from the factory floor to the C suite.

Upon her graduation from Michigan Tech University (BS, environmental engineering), Breanna was accepted into Essity's Graduate Onboarding (GO!) Engineer program, which is an 18-month-long rotational employment opportunity in which the GO! candidates are exposed to multiple parts of the business. Following her experience as a GO! Engineer, Essity hired Breanna as a process engineer on the Napkin Resource Support Team.

In her role as a Process Engineer, Breanna is responsible for working with operators, maintenance, and others to develop standards, centerlines, and processes to improve the efficiency and lower the waste on the napkin machines in her group. During her nearly three years in this role, Breanna has already made a positive impact. She has become instrumental in creating a training program for machine operators. Her communications skills serve her well as a liaison for the operators, as well as in her other responsibility of onboarding machine operators on her team, using the training program that she developed. Breanna also serves as a GO! program mentor, as she herself is an alumna of the program.

According to Breanna, "I am honored to not only have been nominated for, but to be a recipient of, the Emerging Leader Award from the Manufacturing Institute. Since my arrival at Essity, it was clear that there are numerous opportunities for women in manufacturing to succeed here, and I am grateful for the contributions I've been able to make in training and mentoring. I am excited to be a part of the award event, to be among other women leaders, and learn as much as I can to bring back and share with my colleagues at Essity."

"Breanna is a terrific role model for other women in engineering and manufacturing, both within Essity and as a representative outside of the company," said Essity Operations Manager Dan Edwards. "She is motivated and goal-oriented, and well deserving of this award."

"Companies across the US agree there is a talent shortage in manufacturing. Through the STEP Ahead Awards, we hope to take another step toward closing this gap by highlighting the stories of successful women in manufacturing and giving them a platform to encourage other women to join the industry and be role models for the next generation," said Carolyn Lee, executive director of The Manufacturing Institute.

Lifetime Donation Recognition to the CEE Department

Alumni and friends with lifetime donations of $2,500 or more. Please see our CEE website for a complete donation listing of all of our alumni, friends, and corporate donors.

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10th Year in Panama

The CEE International Senior Design (iDesign) program traveled to Panama again this year to assist indigenous communities with basic infrastructure needs. Eight students (6 CEE, 2 ME) divided into two teams and traveled to rural sites in western Panama, where they were hosted by Peace Corps Volunteers. Students met with community members and collected data for their fall semester senior design projects. One team is designing a pedestrian river crossing, and the other team is designing improvements to community water systems. The group also visited the Panama Canal and the biodiversity museum in Panama City. The trip was led by Professor **David Watkins** with assistance from Research Engineer **Henrique (Kiko) de Melo e Silva**. Professor of Practice **Mike Drewyor** is helping to mentor the design teams in the fall term.

REAC

Develop rail transportation and related engineering skills for the 21st century through an interdisciplinary and collaborative program that aligns Michigan Tech faculty and students with the demands of the industry.

Steel Bridge Team

Part of the student Chapter of American Society of Civil Engineers. This team designs and fabricates a new bridge structure each year and competes at the regional and national level.

Chi Epsilon

Established to maintain and promote civil engineering as an ideal profession with the characteristics deemed to be fundamental to the successful pursuit of an engineering career.

Concrete Canoe

This organization utilizes engineering skills, problem solving, and teamwork to build a canoe out of concrete and compete against similar teams from other universities.

Society for Environmental Engineers (SEEn)

Promotes environmental engineering as a unique and viable curriculum and profession and discusses current and new technologies in the field.

Green Campus

Green Campus Enterprise is an organization of students working to make the Michigan Tech campus more sustainable through both low and high profile projects.

TEAM LEADERS (L-R): TRISTAN TARSA, JARED PARKER, SKYLAR CALLIS, JEMEL THOMPSON

Built World Enterprise

The Civil and Environmental Engineering Department is excited to announce that we will launch the Built World Enterprise in the Spring of 2019. The goal of the Built World Enterprise is to provide students with a for-credit, project-based learning opportunity to explore transportation and infrastructure design and create an environment in which students must go beyond their classroom knowledge to create solutions to societal problems.

This enterprise will address challenges typically solved by civil and environmental engineers, which may include designing infrastructure and solving waste management solutions. The Built World Enterprise will launch by participating in the Airport Cooperative Research Program University Design Competition for Addressing Airport Needs. Michigan Tech has been including the Enterprise model of project-based learning as one of the pathways to completing a baccalaureate degree for over 20 years. The Green Campus Enterprise was created in 2009 and is also housed in the CEE Department.

Merchandise

Help our student organizations raise funds through our online department apparel sale.

Shop online:

chi-epsilon-mtu-chapter.square.site

7th Annual Lake Superior Water Festival

More than 700 students in grades 4-12 in 30 classes from 10 schools in Houghton, Baraga, and Gogebic Counties descended upon Michigan Tech's Great Lakes Research Center on Wednesday, October 17, from 9 am to 3 pm, for the 7th Annual Lake Superior Water Festival. Students from the following schools participated: Baraga High School, Barkell Elementary, CLK Elementary, EB Holman School, Houghton Middle School, Ironwood High School, Jeffers Middle School, Lake Linden-Hubbell Middle School, South Range Elementary, and Washington Middle School.

Twenty-four different sessions were presented throughout the day, presented by Michigan Tech scientists (including Dr. Audra Morse and Daisuke Minakata's graduate Student, Ryan Kibler) and graduate students, along with US Coast Guard, Ottawa National Forest, Isle Royale National Park, Keweenaw Bay Indian Community, BHK AmeriCorps and Copper Harbor Trails Club.

The Water Festival provides an opportunity for students to learn about and celebrate our most precious natural resource—the Great Lakes! A wide variety of topics from science and engineering to creative writing will be presented. Students attend four 35-minute activities. Some of the topics to be presented include remotely operated vehicles, leave no trace outdoors, cleaning wastewater, careers with the US Coast Guard, the chemistry of corrosion, design a fog harvester, and more.

> *"Thank you for the opportunity to present at Water Festival. It was a blast to teach the students. Thanks for all your hard work in organizing such a wonderful event. It's so exciting to see kids getting hands-on experience in labs and introduced to science at a young age."*
>
> RYAN KIBLER,
> ENVE MS STUDENT

The 2018 Water Festival is coordinated by the Michigan Tech Center for Science & Environmental Outreach, with funding from the Great Lakes Stewardship Initiative and Michigan Tech's Great Lakes Research Center.

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Pictured above: CEE alum Kevin Madson '14 with former MTU hockey coach Mel Pearson '81