

CIVIL AND ENVIRONMENTAL ENGINEERING

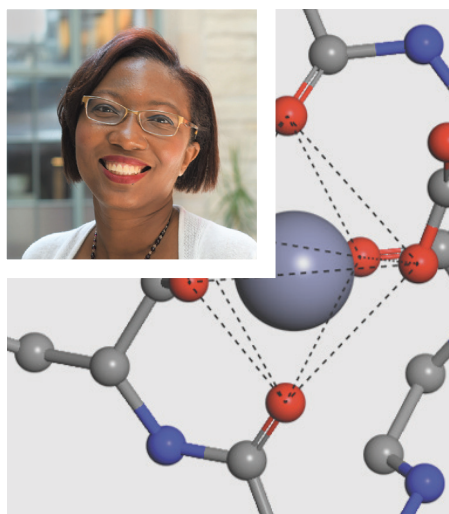
DEPARTMENT WELCOMES PROFESSORS LUDMILLA ARISTILDE AND ALESSANDRO ROTTA LORIA

Northwestern Engineering's Department of Civil and Environmental Engineering is excited to expand its faculty this academic year with two new professors.

Ludmilla Aristilde from Cornell University joins the department as an associate professor, while **Alessandro Rotta Loria** arrives as an assistant professor from the Swiss Federal Institute of Technology in Lausanne (EPFL).

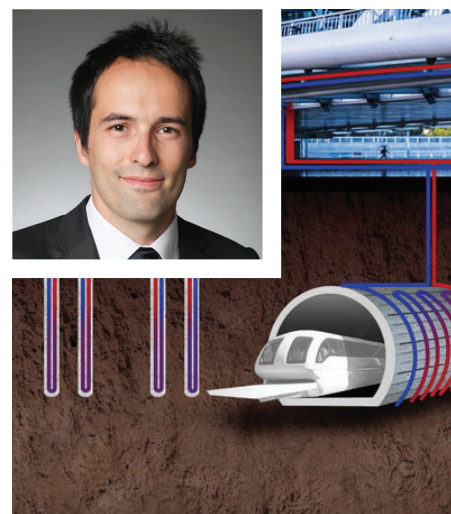
Aristilde studies the chemistry and biochemistry of environmental organic processes with implications for nutrient cycling, agricultural productivity, ecosystem health, and environmental biotechnology. Her research group combines experimental and computational tools to gain novel molecular insights and obtain a fundamental understanding about the “why” and “how” of the environmental behavior of organics to improve the evaluation, prediction, and engineering of solutions for environmental sustainability.

Following her postdoctoral works as a Fulbright Scholar in France and a National Science Foundation (NSF) fellow at Princeton University, Aristilde



started her faculty career in 2012 as an assistant professor in Cornell University's Department of Biological and Environmental Engineering. She was promoted to associate professor with tenure in 2018. She obtained her MS and PhD degrees from the University of California, Berkeley, and BSc and BFA degrees from Cornell.

Rotta Loria, who formally arrived at Northwestern in spring 2019, is interested in fundamental and applied problems centered on the mechanics of geomaterials and structural systems for applications that include energy harvesting and storage, structural and infrastructural protection,



and natural hazards prevention. Within his Mechanics and Energy Laboratory, he addresses theoretical and experimental research activities across multiple scales to understand and engineer the mechanical response of soils and rocks subjected to multiphysical perturbations, investigate the behavior of novel multifunctional geotechnologies, and analyze and design urban geoenergy systems.

Rotta Loria obtained his PhD in mechanics from EPFL and his MSc and BSc degrees in building engineering from the Politecnico di Torino in Italy.

Dear friends and colleagues,

As stalwart adherents to the quarter system, we start our academic year many weeks after most universities, but we accelerate to full speed very quickly. This year is off to a quick and strong start as we welcome two new colleagues, **Ludmilla Aristilde** and **Alessandro Rotta Loria**. Moving to Northwestern from Cornell, Professor Aristilde joins the department as an associate professor and brings her expertise in experimental and computational environmental metabolomics to solve problems related to nutrient cycles, soil fertility, and ecosystem health. Professor Rotta Loria recently completed his PhD and a postdoc at EPFL in Lausanne, Switzerland, and aims his expertise in geomechanics at the interface of energy and structures to devise new ways to harvest and store waste heat.

Ludmilla's and Alessandro's areas of study are perfect examples of convergent research frontiers that go beyond interdisciplinarity, span multiple scales, and tackle big problems. The department completed a strategic plan to guide the next few years and has developed a graphic that captures our central ideas. Inspired by the principle that "systems challenges require systems thinking," CEE faculty are thinking about their research and teaching as it operates in multiple systems. In our many discussions about

future research directions and recruiting talent, CEE faculty agree that the transformative power of our collaborative work is better represented by material systems, ecosystems, urban systems, and human systems than the silos of traditional CEE subareas.

As a testament to this new way of thinking about how our work aligns with the grand challenges facing society, over the last year a number of CEE faculty are initiating large research projects at the interface of multiple systems. Professor **Giuseppe Buscarnera** combines material, ecological, and urban systems in an innovative approach to understand and predict landslides. Professor **Aaron Packman** leads a team to study changing precipitation patterns in the Great Lakes region and the capacity of communities to sustain extreme events, work that integrates eco-, urban, and human systems. Also with National Science Foundation (NSF) funding, I am working with partners at the interface of ecological, urban, and human systems to improve the predictive performance of green infrastructure networks, particularly for low-income communities. A common thread in all of these new initiatives is the design of resilient and adaptive systems in the face of a rapidly changing climate.

Last year, the newsletter featured the large-scale 3D printing efforts of Professor **Gianluca Cusatis** to construct

a model Mars habitat as part of NASA's 3D-Printed Habitat Challenge. As a follow up, we provide a profile of PhD student **Matthew Troemner**, who was instrumental in building our stunning 3D printing laboratory. We also feature the work of Professor **Erica Hartmann**, who again reminds us that CEE research extends to habitats beyond Earth. Erica's research provides insight into the adaptive patterns of microorganisms colonizing the International Space Station.

CEE's global reach continues to grow. I hope that you enjoy reading about our students' experiences in Spain and Argentina. CEE faculty attract acclaim nationally and internationally, as well. We are very proud that Professors **Jim Hambleton** and **Amanda Stathopoulos** received NSF CAREER awards. The number of teaching awards and recognition is at an all-time high for CEE faculty. The department recently celebrated the career of **Rich Finno**, who, after 33 years at Northwestern, has become an emeritus professor.

I hope you enjoy reading about the highlights of 2019, and we wish you well in the coming year.



Kimberly Gray
Kay Davis Professor and
Chair of Civil and
Environmental Engineering

Kimberly Gray, Kay Davis Professor of civil and environmental engineering, became department chair in 2015. With a courtesy appointment in the Department of Chemical and Biological Engineering, Gray is an expert in environmental catalysis and physicochemical processes in natural and engineered environmental systems. Her research focuses on energy and urban sustainability applications. As chair, she aims to further the department's work addressing many of the world's most pressing problems, including infrastructure, urban redevelopment, transportation, energy, and water.

SYSTEMS CHALLENGES REQUIRE SYSTEMS THINKING

New Northwestern Civil and Environmental Engineering graphic reflects collective approach to education and teaching

The Department of Civil and Environmental Engineering (CEE) recently completed its strategic plan for the next five years. From the process emerged new ways to think about research and teaching more collectively.

CEE's work is inspired by many innovations (robotics, autonomous systems, the sharing economy), by technological challenges (rapid decarbonization, resource and energy recovery, large scale additive manufacturing), and by societal needs (rapidly changing climate and rising sea levels, extreme events, social equity).

CEE is transitioning from operating in the traditional silos of solid mechanics and structures, geotechnics, transportation, and environmental engineering to addressing systems challenges with systems thinking as illustrated in its new graphic.



"THE FUTURE OF CEE PRACTICE IS BEING SHAPED BY MASSIVE DISRUPTIVE TECHNOLOGICAL AND ENVIRONMENTAL FORCES THAT REQUIRE NEW WAYS OF THINKING ABOUT OUR RESEARCH AND TEACHING."

KIMBERLY GRAY
KAY DAVIS PROFESSOR AND
CHAIR OF CIVIL AND
ENVIRONMENTAL ENGINEERING

About the Graphic

Civil and environmental engineers comprise the engineering workforce tasked with designing, building, and maintaining the built environment and natural systems, systems that constitute the backbone of our economy. The future of the industry, however, is being reshaped by massive disruptive technological and environmental forces that require a redesign of the way we think about research and teaching. While CEE will continue to offer accredited

degrees, department faculty are thinking about their research differently and more collaboratively. The new graphic reflects a systems framework and shows four systems (material systems, ecosystems, urban systems, and human systems) that describe current and future CEE research. As a first step toward this new organizational approach, each faculty member has selected at least two systems, though a few see their work spanning all four systems.

Buscarnera to Study Landslide Prediction with \$1.4 Million Grant from NSF PREEVENTS Program

Project will combine geomechanics, geomorphology, atmospheric sciences, and physics of complex systems to provide a comprehensive picture of the landslide dynamics

Professor **Giuseppe Buscarnera** has been awarded \$1.4 million from the National Science Foundation's Prediction of and Resilience against Extreme Events (PREEVENTS) program to study the role of geomechanics and remote sensing in early landslide prediction.

The project, titled "Defining Precursors of Ground Failure: A Multiscale Framework for Early Landslide Prediction through Geomechanics and Remote Sensing," aims to define precursors to ground failure through physics-based model simulations and remote sensing to improve the ability to forecast and mitigate hazards at the landscape scale. Combining geomechanics, geomorphology, atmospheric sciences, and physics of complex systems, the project aims to:

Explain how environmental conditions affect changes in landslide velocity

Provide a multiscale weather-hydrology simulation platform to quantify rainfall inputs and soil moisture at the scale of mountain ranges

Formulate numerical models reproducing the spatiotemporal growth of ground failure zones

Propose a multilayer network theory to identify precursors of runaway instability

In collaboration with researchers from North Carolina State University, Middlebury College, NASA, and Argonne National Laboratory, Buscarnera will leverage recent technological advances



Giuseppe Buscarnera

in remote sensing to demonstrate the importance of analyzing the deformation signature of the ground in explaining why hillslopes fail in different ways when subjected to variable weather patterns. He also hopes to understand and recognize the slow deformation mechanisms which precede dramatic failures to help anticipate when, where, and why ground failure occurs, potentially inspiring the design of physics-based early warning systems able to better protect human life and infrastructure.

Gray Receives \$2 Million NSF LEAP-HI Grant

Collaboration will study nature-based strategies to prevent urban flooding

Kimberly Gray, Kay Davis Professor and chair of the Department of Civil and Environmental Engineering at Northwestern Engineering, received a \$2 million grant from the National Science Foundation as part of the Leading Engineering for America's Prosperity, Health, and Infrastructure program (LEAP-HI).

Working with an interdisciplinary team of collaborators from the University of Pittsburgh, Center for Neighborhood Technology in Chicago, and Greenprint Partners, Gray and her collaborators will create an innovative toolbox enabling communities to transform the urban



Kimberly Gray will use an NSF LEAP-HI grant to develop tools to help communities transform urban landscapes.

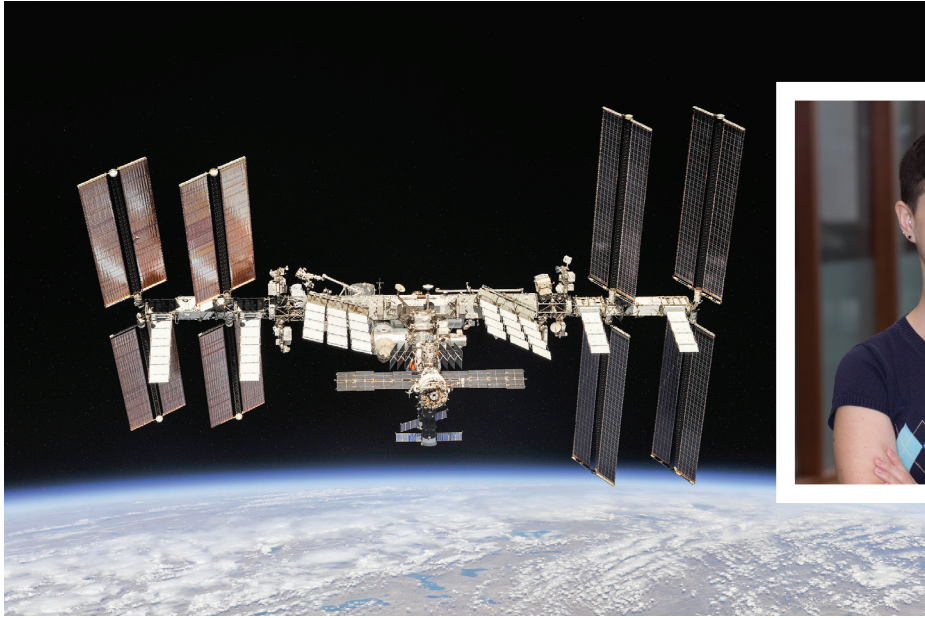
landscape structurally and functionally by expanding the quantification of Green Infrastructure (GI) benefits beyond water quantity to include cascading human and

ecological co-benefits. The team hopes to improve the design, implementation, and performance of stormwater infrastructure to reduce acute and chronic flooding and increase the ability of communities — particularly those in under-resourced areas — to prepare for, recover from, and adapt to extreme weather events.

By integrating ecologically (nature) based Green Infrastructure with existing Built Infrastructure, the project, titled "Catalyzing Resilient Urban Infrastructure Systems: Integrating the Natural & Built Environments," will develop technical and financial strategies to protect local communities from current and future flood damages and boost economic, social, and ecological redevelopment in neighborhoods across the US.

SPACE MICROBES AREN'T SO ALIEN AFTER ALL

Genetic evidence shows bacteria on the International Space Station (ISS) are adapting to survive, not to harm



Above: Erica Hartmann
Left: The International Space Station

The ISS houses thousands of different microbes, which have traveled into space either on astronauts or in cargo. Hartmann's team used data from the National Center for Biotechnology Information to compare the strains of *Staphylococcus aureus* and *Bacillus cereus* on the ISS to those on Earth. Found on human skin, *S. aureus* contains the tough-to-treat MRSA strain. *B. cereus* lives in soil and has fewer implications for human health.

While the team found that the bacteria isolated from the ISS did contain different genes than their Earthling counterparts,

those genes did not make the bacteria more detrimental to human health. The bacteria are instead simply responding, and perhaps evolving, to survive in a stressful environment.

Although this is good news for astronauts and potential space tourists, Hartmann points out that unhealthy people can still spread illness on space stations and space shuttles.

"Everywhere

you go, you bring your microbes with you," Hartmann said. "Astronauts are exceedingly healthy people. But as we talk about expanding space flight to tourists who do not necessarily meet astronaut criteria, we don't know what will happen. We can't say that if you put someone with an infection into a closed bubble in space that it won't transfer to other people. It's like when someone coughs on an airplane, and everyone gets sick."

A study led by Professor Erica Hartmann has found that — despite its seemingly harsh conditions — the ISS is not causing bacteria to mutate into dangerous, antibiotic-resistant superbugs.

"There has been a lot of speculation about radiation, microgravity, and the lack of ventilation and how that might affect living organisms, including bacteria," Hartmann said. "These are stressful, harsh conditions. Does the environment select for superbugs because they have an advantage? The answer appears to be 'no.'"

As the conversation about sending travelers to Mars gets more serious, there has been an increasing interest in understanding how microbes behave in enclosed environments.

"People will be in little capsules where they cannot open windows, go outside, or circulate the air for long periods of time," Hartmann said. "We're genuinely concerned about how this could affect microbes."

"PEOPLE WILL BE IN LITTLE CAPSULES WHERE THEY CANNOT OPEN WINDOWS, GO OUTSIDE, OR CIRCULATE THE AIR FOR LONG PERIODS OF TIME. WE'RE GENUINELY CONCERNED ABOUT HOW THIS COULD AFFECT MICROBES."

ERICA HARTMANN

CEE STUDENTS ON THE INTERNATIONAL STAGE

Civil and environmental engineering students travel to Argentina and Spain as part of immersive education and research experiences

GLOBAL COLLABORATION

In fall 2018, a collaboration between Northwestern and Universidad Nacional de San Martín (UNSAM) in Buenos Aires, Argentina, was selected by the 100,000 Strong in the Americas Innovation Fund, a partnership between the US Department of State, Partners of the Americas, and NAFSA: Association of International Educators designed to fuel strategic university partnerships between the Americas. The Northwestern-UNSAM project is one of 10 newly funded partnerships between higher education institutions in the US and Argentina.

The university partnership is led by Professor **Kimberly Gray** from Northwestern Engineering, and Professor Roberto Candal, secretary of research in the 3iA Institute for Environmental Engineering at UNSAM. The joint effort supports research focused on energy and resource recovery, ecotoxicology, and novel materials for environmental applications.

Seven PhD students in Northwestern Engineering's environmental engineering and science program traveled to Buenos Aires in July to learn about UNSAM research, ranging from photoactive material synthesis and applications to the use of biomarkers to determine the ecotoxicity of various water contaminants. During the weeklong trip, they also observed research about the use of bacteria to extract metals from minerals, the design of reactors to remediate sediments contaminated by metals, and the recovery of energy in the form of methane produced from polluted water.



Clockwise from top left: During the trip, students toured Tigre Delta Agricultural Experimental Station, where researchers study the effects of afforestation on rural development and environmental health; Environmental engineering PhD students, from left to right: Jieun Kim, Lilianna Hernandez-Gonzalez, Shushan Wu, Han Fu, Paul Roots, Natalia Obrzut, and Haley Lewis; Students also visited Patagonia, where they viewed the Glaciar Perito Moreno.

RETURNING THE HOSPITALITY



The USNAM students, from left to right: Victoria Passucci, Elias Cruz, Julieta Pelusa, and Estafania Bracco.

The Northwestern students returned the hospitality they received in Argentina by hosting four students from Universidad Nacional de San Martín in October. During their monthlong visit, UNSAM students toured Northwestern Engineering's environmental engineering labs and learned about the range of research conducted in the department. They also worked on individual projects within the research labs of Professors **Neal Blair, Jean-François Gaillard, and Kimberly Gray.**

The exchange program laid the foundation for continued research collaborations around complex issues tied to the protection of human and ecological health and environmental restoration.

ARCHITECTURAL ENGINEERING AND DESIGN STUDENTS STUDY IN SPAIN



From left to right: Manos Proussaloglou, Kannon Nelms, Molly Lazar, Julia Nicholson, Erika Mateus, Anna Kornreich, Mark Galperin, Jacob Webb, and Lawan Alade-Fa.

Larry Booth, Luis Collado, and Jose Luis de la Fuente. The five-day stay in Madrid was filled with architectural tours, museum visits, and hands-on design activities with professionals in the Madrid office of engineering design firm Arup, before heading to Barcelona for the weekend.

The AED certificate program prepares next-generation engineers to create spaces and structures that not only meet functional needs but are also aesthetically appealing and innovative. By sponsoring study in Europe, the program challenges students to understand the ideas behind the designs built in different environments and cultures. The international program was the idea of the late Richard Halpern, principal benefactor of the AED program, who was committed to learning from international examples of creative design and designers.

Every two years, Northwestern's Architectural Engineering and Design (AED) certificate program sponsors a five-day trip to a European city, where students study and work with internationally renowned

architects and immerse themselves in local history and culture. In September, nine Northwestern AED students traveled to Spain to explore the architecture of Madrid and Barcelona. The group was accompanied by AED faculty **Scott Cyphers,**

AMANDA STATHOPOULOS AND JAMES HAMBLETON RECEIVE NSF HONORS FOR YOUNG FACULTY

Amanda Stathopoulos and James Hambleton, both assistant professors in the Department of Civil and Environmental Engineering, have each received Faculty Early Career Development Program (CAREER) awards from the National Science Foundation.

The \$500,000, five-year awards from NSF's Division of Civil, Mechanical, and Manufacturing Innovation will support research and education initiatives.

Stathopoulos's research is at the intersection of engineering and social science and focuses on improving transportation options by integrating models that combine individual and community behaviors and perspectives. With her CAREER award, she aims to transform future mobility decision making,



James Hambleton and Amanda Stathopoulos

ensuring that technologies and services like public transit, active mobility, and crowdsourcing deliver public value and make cities more prosperous and livable.

"I look forward to continuing to explore methodologies that reflect both quantitative and qualitative perspectives to address the complex, evolving nature of mobility platforms and users' motivations,"

Stathopoulos said. "This research will produce new tools for policy evaluation that will allow all parts of society to benefit from disruptive sociotechnical changes."

Hambleton's research focuses on understanding the mechanical behavior of soils and other geomaterials, with applications ranging from terrestrial robotics to the design of geotechnical infrastructure. With his CAREER award, Hambleton will investigate the processes through which machines interact with soils and develop models that underpin the design of future autonomous devices used for construction, mining, agriculture, and mobility.

"This award launches an exciting new phase of my group's research, and it crystallizes our identity in the emerging interdisciplinary field of soil-machine interaction," Hambleton said. "I am equally excited about attracting and educating future civil engineers through integrated education projects and outreach activities."

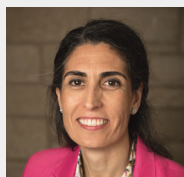
Symposium Celebrates Professor Richard Finno

In July, the Department of Civil and Environmental Engineering hosted a symposium celebrating the retirement of Professor Richard Finno. Finno, whose research combines theory and practice in order to reconcile full-scale field performance of geotechnical structures with analytical and numerical predictions, was honored by friends and colleagues for his nearly 33-year teaching career at Northwestern.



Richard Finno (center) with Department of Civil and Environmental Engineering colleagues and friends.

FACULTY NEWS



Arantzazu Alarcon-Fleming received a 2018 Cole-Higgins Award for Excellence in Teaching from Northwestern Engineering for her relentless enthusiasm

for teaching engineering mechanics and supporting student success.



Zdeněk P. Bažant was elected foreign associate of the Engineering Academy of Japan. His nonstatistical energetic size effect law was formally

adopted in the American Concrete Institute design code specifications. In a Stanford University worldwide citation survey, he ranked number one in civil engineering and number two in all engineering fields.



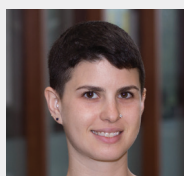
Karen Chou was named to the 2019-20 Northwestern Associated Student Government Faculty and Administrator Honor Roll in recognition of her work

teaching the Structural Steel Design course.



James Hambleton received the 2019 Arthur Casagrande Professional Development Award from the American Society of Civil Engineers. He also received the

2019 Alumnae of Northwestern University Award for Curriculum Innovation and was named to the 2018-19 Northwestern Associated Student Government Faculty and Administrator Honor Roll.



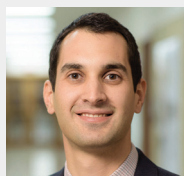
Erica Hartmann and her lab signed a contract with the Centers for Disease Control and Prevention (CDC) as part of the CDC's Innovate

Projects to Combat Resistance program.



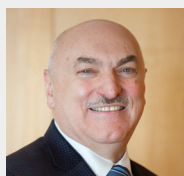
Yonggang Huang received the 2019 Theodore von Karman Medal from American Society of Civil Engineers, the organization's highest award in mechanics.

He was also named to the 2018-19 Northwestern Associated Student Government Faculty and Administrator Honor Roll.



Sinan Keten received the 2019 Walter L. Huber Civil Engineering Research Prize from the American Society of Civil Engineers. He also received the

2019 Sia Nemat-Nasser Early Career Award from the American Society of Mechanical Engineers.



Hani Mahmassani received the Martin Beckmann Transformative Research in Transportation Award from the Transportation Research Board's

Transportation Network Modeling Committee. He also earned the 2018 Best Paper Award from the journal *Transportation Research Part C: Emerging Technologies*.



“There needs to be an investment in accumulation of data and public access to the data so that, first of all, decision making is transparent. Second, communities can understand and implement their own solutions. And then third, we can identify emerging challenges and address them effectively.”

— **PROFESSOR AARON PACKMAN**, who addressed the US House Select Committee on the Climate Crisis in August about climate adaptation in the Great Lakes region.

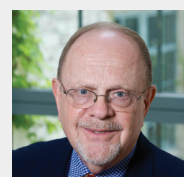


Aaron Packman is a member of a Northwestern University research team that received a \$1 million Convergence RAISE grant from the National

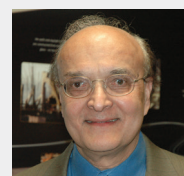
Science Foundation for the project “Systems Approaches for Vulnerability Evaluation and Urban Resilience.”



Alessandro Rotta Loria won the Deep Foundations Institute 2018 Young Professor Paper Competition.



Joseph Schofer received the Council of University Transportation Centers' HNTB CUTC Lifetime Achievement Award for University Transportation Education and Research.



Surendra Shah was elected as a corresponding member of the Academy of Athens, Greece's national academy. He was also elected to the Russian Academy of Engineering.

Department Hosts Inaugural ‘Up Goer 5’ Poster Competition

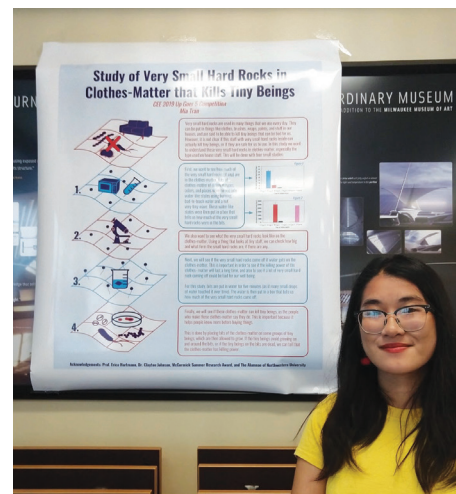
Contest challenges students to present research using only commonly used words

In July, the Department of Civil and Environmental Engineering held its inaugural CEE Undergraduate Up Goer 5 Poster Competition, which challenged students to create research posters explaining their work using only the 1,000 most commonly used words in the English language.

Mia Tran, who worked with Professor **Erica Hartmann** and postdoc **Clayton Johnson**, received the Best Overall Award for her poster titled “Study of Very Small Hard Rocks in Clothes-Matter that Kills Tiny Beings.”

Garrett Lee, who worked with Professors **Amanda Stathopoulos** and **Marco Nie** on smart transportation, was recognized with the most creative visual display for his poster titled “Joining Shared Car Rides and Trains?”

Hanna Bertucci, who also worked with Hartmann and graduate student **Alexander McFarland**, was recognized for the most creative word/phrase substitution for the phrase “block death from cleaning bar” to



Mia Tran

signify triclosan resistance in bacteria. Her poster was titled “Round Set of 4 Letters Blocks Death from Cleaning Bar.”

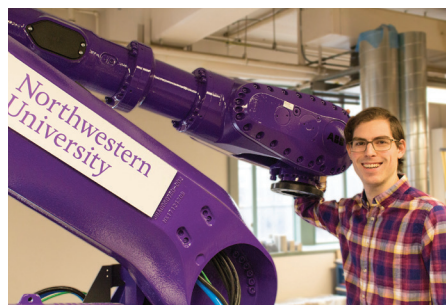
Student Spotlight: Matthew Troemner

PhD student led Northwestern’s submission into the NASA 3D-Printed Habitat Challenge

When **Matthew Troemner** arrived at Northwestern in 2017 as a PhD student in Professor **Gianluca Cusatis**’s Quasi-Brittle Materials Research Group, he wholly expected to begin work further developing a Lattice Discrete Particle Model — previously created by Cusatis — that could be used to simulate the failure behavior of concrete.

Yet it wasn’t long before he was tasked to lead a different project — Northwestern’s submission into the NASA 3D-Printed Habitat Challenge, a multiyear competition that challenged teams from around the world to create new technologies to manufacture a home on Mars using materials native to the planet.

Troemner, who received an ME in structural engineering and a BS in architectural engineering from the Illinois Institute of Technology, spent the next 15-months leading an interdisciplinary team of more



Matthew Troemner stands next to the multi-axis robotic arm from ABB Group used to 3D-print 1:3 scale elements of its Martian habitat design.

than two dozen Northwestern students to develop comprehensive habitat designs, “Marscrete” building materials, and a large-scale 3D printer capable of printing a 1:3 model of their Martian home.

Among the team’s accomplishments, the group earned fifth place honors in the competition’s July 2018 Level 1 Virtual Design Challenge. Called Martian 3Design, the proposed habitat was one of only

18 submissions from around the world chosen to be judged by NASA experts and placed higher than any other university submission.

While work on the NASA Habitat Challenge ended in spring 2019, Troemner believes that Northwestern’s emphasis on large-scale 3D-printing is just beginning. He plans to continue to improve the 3D printer’s filament extruder, refine the materials his team created, and develop technology beneficial to real-world infrastructure projects — its impact will just be felt a bit closer to home.

TROEMNER
BELIEVES THAT
NORTHWESTERN’S
EMPHASIS ON
LARGE-SCALE
3D-PRINTING IS
JUST BEGINNING.

STUDENT NEWS



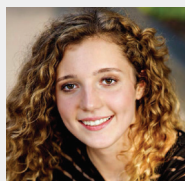
PhD students **Susan Alexis Brown** (left) and **Ritaja Ray** (right) each received an Engineering Analysis II Teaching Assistant Award for excellence in teaching, as voted on by students and EA II faculty.



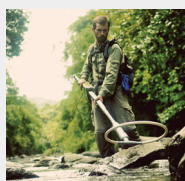
Senior **Katrin Chandra** received the SEF Undergraduate Scholarship from the Structural Engineers Foundation for the 2019-20 academic year.



PhD student **Lama Al Hajj Hassan** was awarded the Helene M. Overly Scholarship from the Women in Transportation Greater Chicago Area Chapter.



Senior **Molly Lazar** received the 2019 Y.C. Yang Civil Engineering Scholarship from the American Society of Civil Engineers.

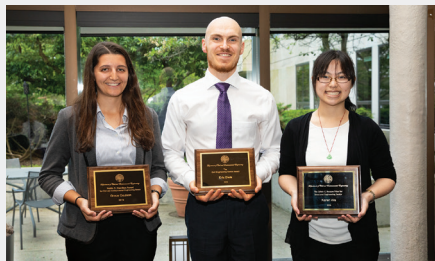


Colin Phillips, a postdoctoral fellow studying how to manage large river systems, received the NatureNet Fellowship from the Nature Conservancy.

Grace Goulson received the Wallis S. Hamilton Award given to a civil engineering senior.

Eric Diels received the Civil Engineering Senior Award.

Karen Wu received the Department of Civil and Environmental Engineering Edwin C. Rossow Prize for Structural Engineering Senior.



Goulson, Diels, and Wu

STUDENT COMPETITION 'SPARKS' INNOVATIVE SOLUTIONS TO INDUSTRY ISSUES



In March, under the guidance of Professor **Karen Chou**, eight undergraduate students from civil and environmental engineering and mechanical engineering took part in SPARK, an industry competition where interdisciplinary student teams develop solutions to real-world problem statements.

Students **Katrin Chandra** and **Christopher Lee** and their team earned first place at the competition for designing an innovative water purification process for a chemical manufacturing plant.

"MY RESEARCH IN 180 SECONDS" STUDENT WINNERS

Each spring the Department of Civil and Environmental Engineering hosts its annual "My Research in 180 Seconds" competition. Open to all undergraduate and graduate students in the department, the event challenges students to present their research to a panel of judges in three minutes using only one PowerPoint slide. This year's winners were:

1ST PLACE



Matthew Verosloff

AUDIENCE CHOICE



Chenyang Li



Jiaxian Shen

PhD student **Matthew Verosloff**: "Point of Care Diagnostics for Pathogen and Water Contaminants"

PhD student **Chenyang Li**: "Mars: Better Place to Live?"

PhD student **Jiaxian Shen**: "Developing a Better Method for Risk Assessment of Antibiotic Resistance in Hospital Environment"

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Engage with Civil and Environmental Engineering

Gifts to the Department of Civil and Environmental Engineering are used to support innovative educational experiences and help the department reach a new level of excellence and impact by investing in these priorities:

Enhancing the student experience with new classes, co-curricular activities, and lab research opportunities

Supporting outstanding faculty, who teach and mentor undergraduate and graduate students

Advancing research that tackles challenges in environmental engineering and science; geotechnics; mechanics, materials, and structures; and transportation systems analysis and planning

To give to the department, please visit the WE WILL campaign homepage at wewill.northwestern.edu and direct your gift to Civil and Environmental Engineering using "Search additional gift designations."

