Northwestern | McCORMICK SCHOOL OF ENGINEERING

Civil and Environmental Engineering

FROM THE CHAIR / Spring 2025

Dear friends and colleagues,

As we enter the final weeks of the academic year, I am eager to share with you the many accomplishments of my CEE colleagues. And given the remarkable events unfolding over federal funding of university research at Northwestern and many of our peer institutions, I want to take this opportunity to highlight the consequential innovations that CEE faculty and students are advancing to solve society's grand challenges.

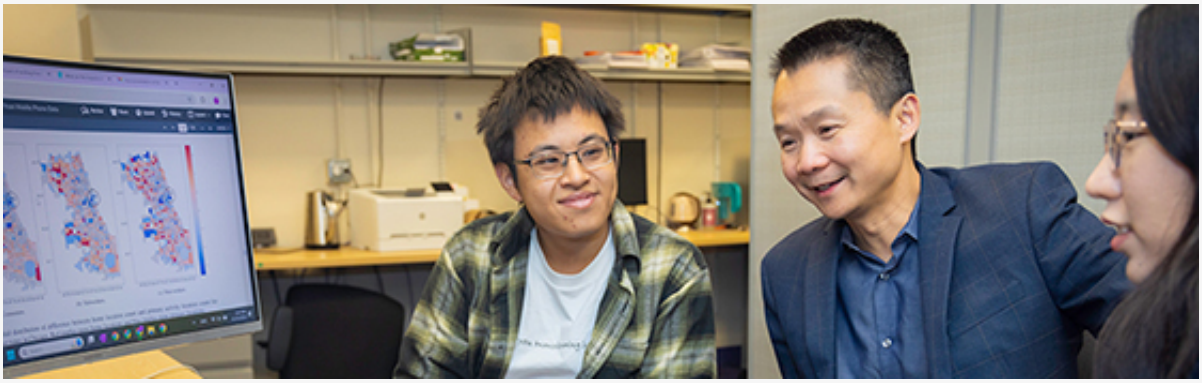
CEE research excels at improving accessibility among all people safely, as well as creating materials that enhance human well-being and health and contributing to food and climate security. For instance, Professor **Marco Nie** develops models that simulate how justice and equity can be integrated into transit design, and Professor **Joseph Schofer** works to improve road safety. Professor **Yonggang Huang** is part of a design group that is making extraordinary progress in developing materials that mimic the complex sensations of human touch. Surprising insights are made by Professor **Sinan Keten** that explain the strength of silk fibers, by Professor **Ludmilla Aristilde** that reveal the role of iron oxides in catalyzing phosphorus availability for plant growth, and by Professor **Alessandro Rotta Loria** that demonstrate how seawater, electricity, and CO2 can be used to manufacture carbon-negative materials.

These examples are a small set of the activities in CEE that illustrate our key mission of educating the next generation of engineering leaders and generating knowledge that fuels discovery and invention.

We hope you enjoy catching up with CEE news. Thank you very much for your support in these difficult times. I wish you a tranquil summer.

Kimberly Gray

Roxelyn and Richard Pepper Family Chair
Professor of Civil and Environmental Engineering
McCormick School of Engineering



A Systems-Thinking Approach to Transportation

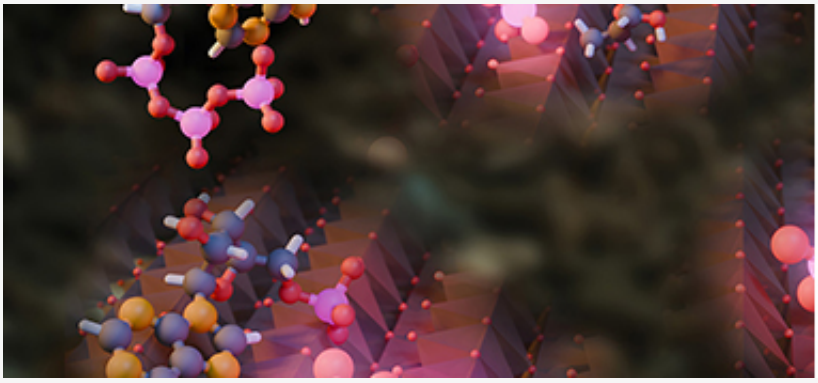
Professor **Marco Nie** examines how to make transportation systems more efficient and sustainable.

Feeling the Future: New Wearable Device Mimics Complexity of Human Touch

The device developed by Professor **Yonggang Huang** goes beyond the buzz to create a sophisticated variety of haptic sensations.

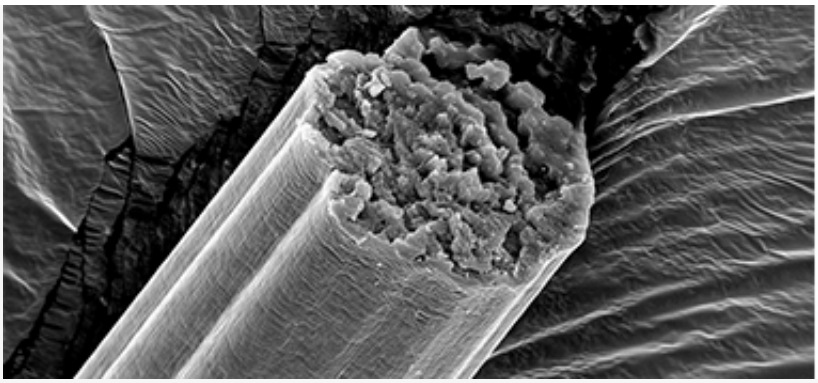
New Carbon-Negative Material Could Make Concrete and Cement More Sustainable

The innovative process developed by Professor **Alessandro Rotta Loria** converts CO2 into solid, durable, carbon-trapping materials.



Iron Oxides Act as Natural Catalysts to Unlock Phosphorus to Fuel Plant Growth

A study by Professor **Ludmilla Aristilde** found that minerals drive phosphorus release at enzyme-like rates.



Stretching Spider Silk Makes It Stronger

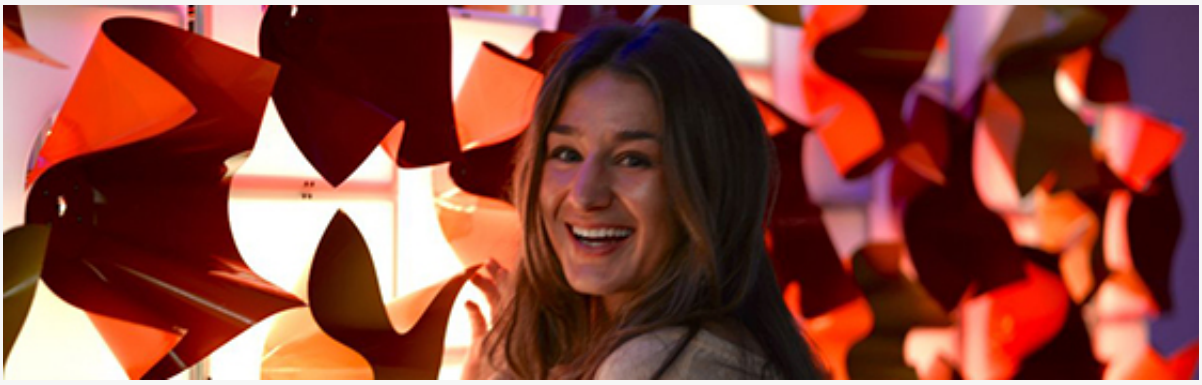
A study from Professor **Sinan Keten** found that the amount of stretching determines the fibers' properties.

Getting Serious About Motor Vehicle Deaths

Highway deaths have skyrocketed in the US. Professor **Joseph Schofer** chaired a group who published a study detailing a new process for disseminating necessary research to engineers in the field.

Jamboree Sparks New Vision for University-Wide Water Research

Organized by Professor **Aaron Packman**, the interdisciplinary event united faculty to tackle water challenges and sustainability.



Faculty Spotlight: Lucia Stein-Montalvo

Professor **Lucia Stein-Montalvo's** curiosity and love of community led her to teach. At Northwestern, she's excited to further her kirigami design research.

Faculty Spotlight: Federico Ciardo

When he's not traveling or playing "footvolley," Professor **Federico Ciardo** is developing theoretical models to enhance our understanding of fault failure mechanics and seismicity which can keep people safer and make energy and resource extraction more sustainable.

Alumni Profile: Mark Embraces Curiosity

Ally Mark (’18, MS ’19) encourages students to be curious as they pursue a wide range of topics.

Faculty Awards

Bažant Elected Life Member of ASME

The honor is the latest for Professor **Zdeněk P. Bažant**, who is also the namesake of an American Society of Mechanical Engineers medal that was announced in 2023.

Huang Honored with Namesake Medal for Collaborative Research at Texas A&M

The annual award, commemorating the prolific collaboration between Professors **Yonggang Huang** and John Rogers, will recognize outstanding research by fellows at the Hagler Institute for Advanced Study and Texas A&M students.

Rotta Loria Honored with 2025 C2ST Innovative Research Award

The award for Professor **Alessandro Rotta Loria** is presented to an organization or individual that has had and will continue to make a significant impact on the advancement of research and discovery.

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