

Mechanical Engineering

FROM THE CHAIR / Spring 2023

Dear friends and colleagues,

As spring blooms around us, we are delighted to bring you the latest edition of our department newsletter. In this issue, we have gathered a range of news, events, and awards that showcase the exciting developments taking place in the Department of Mechanical Engineering at Northwestern.

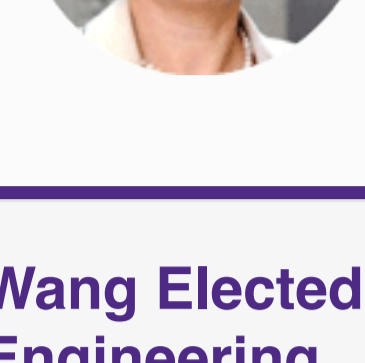
Foremost, we are thrilled that three of our female faculty members have been recognized at the national level: Professor Jane Wang has been elected to the National Academy of Engineering for her contributions to tribology in surface engineering, Professor Jian Cao has been elected to the American Academy of Arts and Sciences for her contributions to advanced manufacturing, and Professor Brenna Argall was elected to the American Institute for Medical and Biological Engineering's College of Fellows for her contributions to the field of robotics and human-machine interfaces. We are also proud that our distinguished alum, Gwynne Shotwell (MS '88), the president and COO of SpaceX, received the prestigious Washington Award for her role in spearheading private enterprise space exploration.

We are also pleased to present our research breakthroughs in a wide range of emerging areas that make us proud to be mechanical engineers. Some of these advances include team-based mobile "moccobots," robotic arm movement, low-cost miniature 3D printing, and protein delivery optimization.

After almost three years of the ongoing pandemic, our student-led extracurricular activities have become vibrant again, with significantly increased in-person activities and exciting competition success. Spring is also the time we receive wonderful news about graduate fellowship awards for both current PhD students and graduating seniors.

As we look forward to the rest of the academic year, we remain committed to our mission of fostering academic excellence, promoting intellectual curiosity, and building a vibrant, inclusive community. We invite you to join us in this endeavor, and to stay informed and involved through our various events, programs, and resources.

Thank you for your continued support and partnership, and we wish you a joyful and productive spring season.



Wei Chen
Wilson-Cook Professor in Engineering Design
Professor and Chair
Department of Mechanical Engineering
McCormick School of Engineering

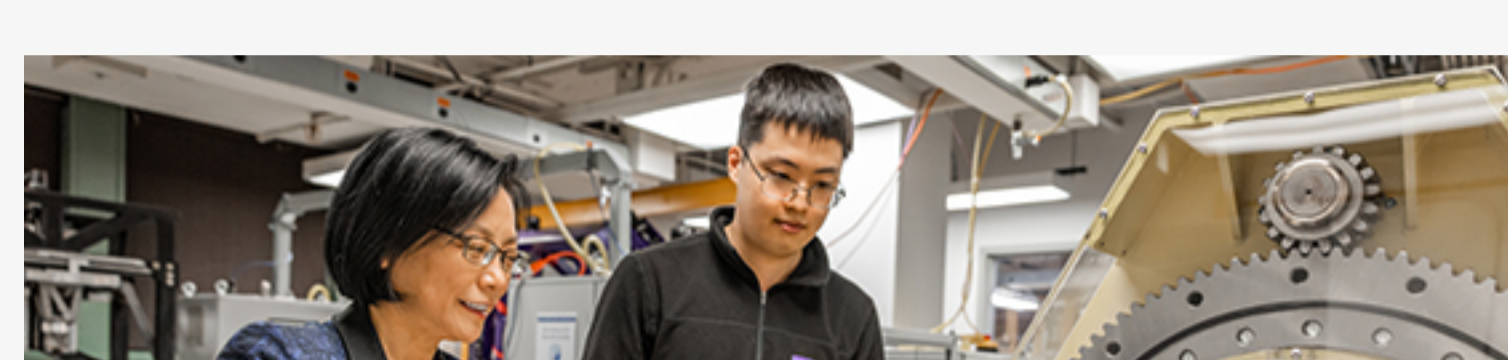
Wang Elected to the National Academy of Engineering



Professor Q. Jane Wang, a leader in tribology and the study of surface science, is among 124 new NAE members. ME alum Roger Kamm ('72) and department advisory board member Markus Buehler, both professors at MIT, were also elected.

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Cao Elected to American Academy of Arts and Sciences



Professor Jian Cao is among the nearly 270 members elected in 2023 drawn from academia, the arts, industry, policy, research, and science.

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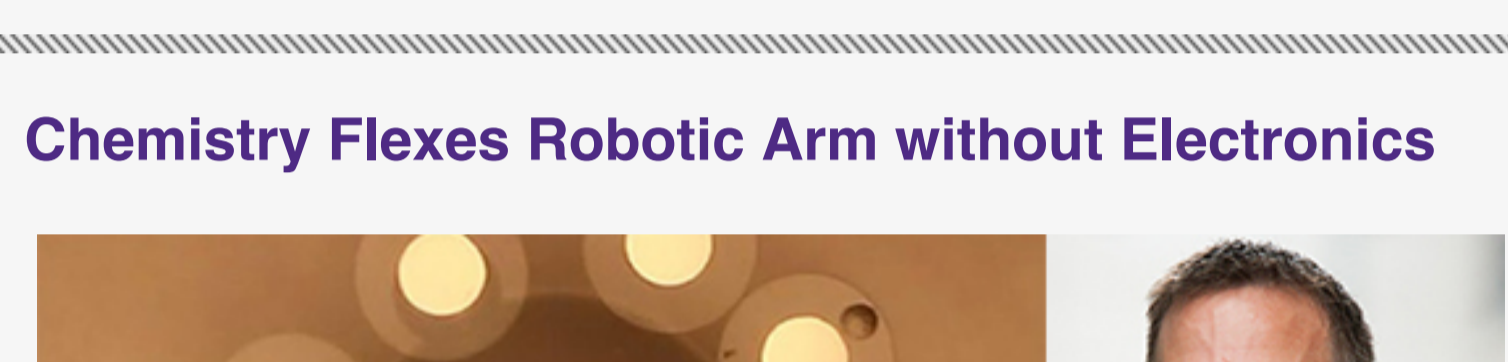
The Future of Human-Robot Interaction Is Mobile



Researchers in the Center for Robotics and Biosystems including Professor Kevin Lynch and Professor of Instruction Matthew Elwin have designed team-based, mobile "moccobots" that could mean a new era of human-robot interaction in construction, manufacturing, and space exploration. VIDEO

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Chemistry Flexes Robotic Arm without Electronics



A team with Professor Todd Murphey and PhD candidate Thomas Berrueta has discovered a way to create slow movements in microrobotics using only chemistry.

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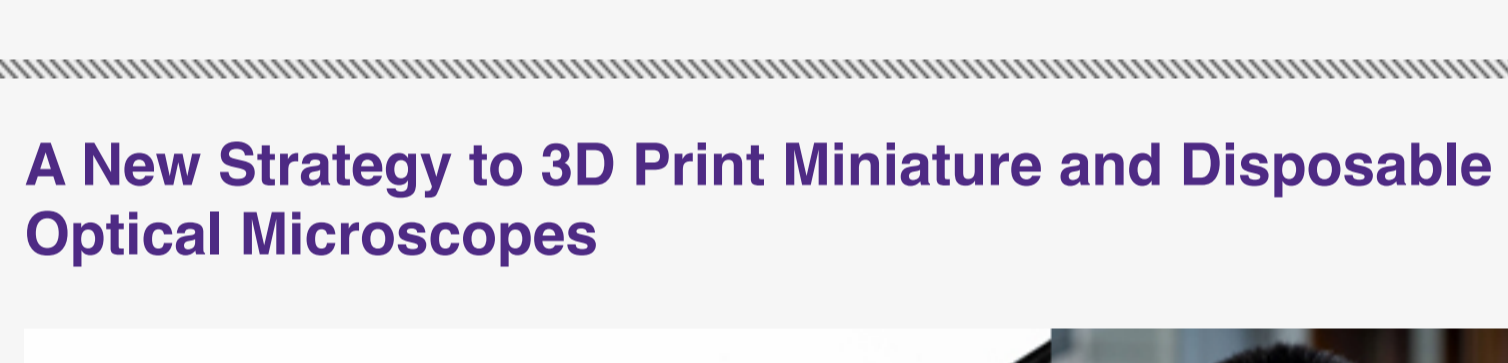
Argall Inducted into the AIMBE College of Fellows



Professor Brenna Argall is among the 140 engineers in the College of Fellows Class of 2023, who were formally inducted during AIMBE's Annual Event in Arlington, Virginia.

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A New Strategy to 3D Print Miniature and Disposable Optical Microscopes



The low-cost platform developed by Professor Cheng Sun employs 3D printing to unify the traditionally discrete manufacturing processes for ease of assembly and cost-savings.

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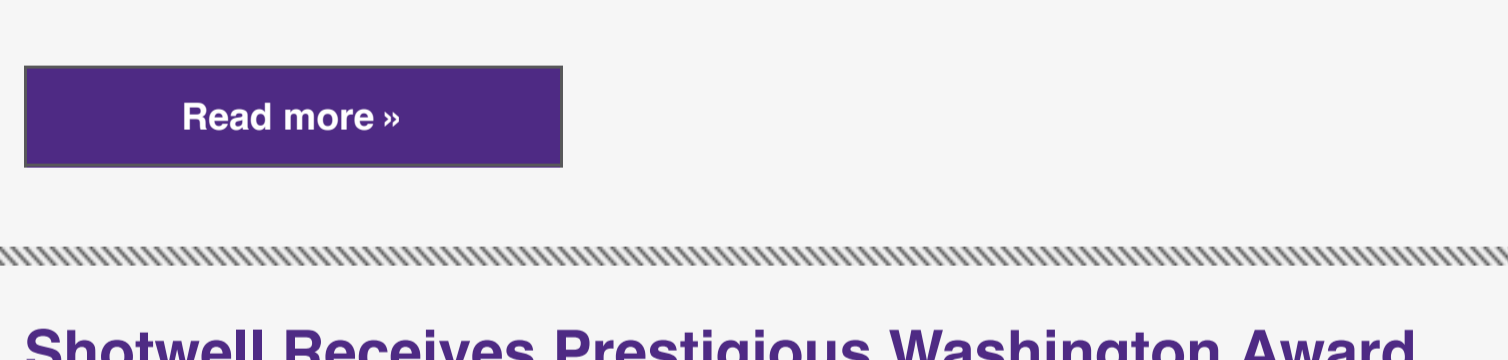
Optimizing the Delivery of Proteins



A method of molecular delivery from Professor Horacio Espinosa called localized electroporation achieves direct and efficient transport of engineered proteins and proteins-nucleic acid structures.

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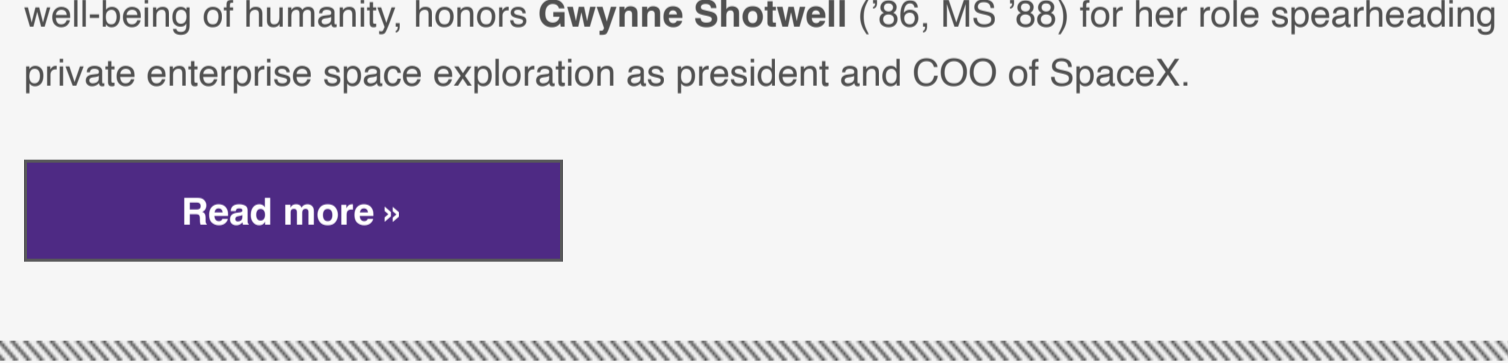
Shotwell Receives Prestigious Washington Award



The award, conferred annually upon an engineer whose attainments have promoted the well-being of humanity, honors Gwynne Shotwell ('86, MS '88) for her role spearheading private enterprise space exploration as president and COO of SpaceX.

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Mourning the Loss of Two Faculty Members



The Department of Mechanical Engineering has lost two faculty members who left important legacies at Northwestern.

Herbert SuYuen Cheng, Walter P. Murphy Professor Emeritus of Mechanical Engineering, passed away at age 92 on October 24, 2022. He will be remembered for his research in tribology, the accomplishments of his students, and his dedication to Northwestern Engineering.

Two years after the passing of Leon M. Keer, his work continues to impact the Department of Mechanical Engineering. In October, the department hosted the Leon M. Keer Memorial Symposium. Speakers included subject-matter experts and Keer's family.

Awards, Honors, and News

Brenna Argall is leading a multidisciplinary team of academic, industry, and non-profit partners that received a Phase 1 NSF Convergence Accelerator award to enhance safety and facilitate independent wheelchair operation.

Zdeněk Bažant will receive an honorary doctorate from the University of Minnesota.

Michael Beltran and Jeremy Keys were featured in a Searle Center "Great College Teaching" event.

Jian Cao was named a 2022 Researcher to Know by the Illinois Science and Technology Coalition.

Wei Chen was named a BRITE Fellow by the National Science Foundation and received the five-year BRITE Fellow grant worth \$1 million for her research on "AI-Enabled Discovery and Design of Programmable Material Systems."

Ping Guo was awarded the F.W. Taylor Medal by the International Academy for Production Engineering.

Yonggang Huang was named among global "Highly Cited Researchers" for 2022, and was elected to the Canadian Academy of Engineering.

Jeremy Keys received The Alumnae of Northwestern University's Award for Curriculum Innovation, which recognizes and supports faculty who have innovative ideas for new courses, methods of instruction, and components of existing classes.

During an April event co-hosted by Northwestern Engineering and the Block Museum of Art, Malcolm MacIver and artist-at-large Dario Robleto discussed how art and science explore the physical and temporal limits of human life.

John Rogers delivered the US National Committee of Theoretical and Applied Mechanics Distinguished Lecture in Washington, DC.

The Northwestern Baja Racing team, led by senior Laura Ferrucci, finished fifth at a winter race in Houghton, Michigan.

PhD student Joseph Leonor received the 2023 National Defense Science and Engineering Graduate Fellowship Award.

Julian Rocher was co-captain of an interdisciplinary group that was selected for funding in NASA's BIG Idea Challenge: Lunar Forge.

Senior Jun Yamasaki was named a 2023 Quad Fellow, part of an initiative of the governments of Australia, India, Japan, and the United States designed to build ties among the next generation of scientists and technologists.

Rujing Zha received an NSF Graduate Research Fellowship. Zha is working on his PhD with Jian Cao, researching metal additive manufacturing processes, such as directed-energy deposition, incorporating both experimental and simulation aspects.

FACTS & FIGURES

Table with 3 columns: 9 National Academy of Engineering members, 14 Major centers, institutes, and programs led by ME faculty, 15 Awardees of young investigator awards



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