Northwestern | McCORMICK SCHOOL OF ENGINEERING

Electrical and Computer Engineering

FROM THE CHAIR / Spring 2025

Dear friends and colleagues,

As we move into summer, I am happy to share some recent highlights from our department.

I am continually impressed by the dedication of our faculty and students to address important problems that will benefit society. Examples include developing novel sensors for advanced robotic touch, new techniques for improving speech quality in wearable devices, or the first demonstration of transmitting quantum information over fiberoptic cables that are also carrying Internet traffic.

Our faculty, students, and alumni continue to be recognized for their dedicated work. Among the many honors we are celebrating, Ted Sargent was named to the National Academy of Inventors, electrical engineering PhD student Abdul Latif Bamba was awarded a 2025 US National Science Foundation Graduate Research Fellowship, and alum Russell Taylor Johns (’82) was elected to the National Academy of Engineering Class of 2025.

As you’ve likely heard, a notable portion of Northwestern’s federally funded

research is subject to stop work orders, and our department has felt the effects of these decisions directly. We remain committed in our mission to develop the innovative technologies that will help address the global challenges we face. Research is pivotal to that mission, as is educating future engineers in the field who will further this work and implement these tools in society. I am proud of how our department has come together to navigate these challenges and chart a path forward to continue to perform impactful research while educating our students.

Best regards,

Randy Berry

Chair and John A. Dever Professor
Department of Electrical and Computer Engineering
McCormick School of Engineering

Robotic Touch Sensors Are Not Just Skin Deep

A team led by Professor **Matthew Grayson** has overcome a major barrier to achieving a low-cost solution for advanced robotic touch.

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First Demonstration of Quantum Teleportation over Busy Internet Cables

Professor **Prem Kumar** and a team including electrical engineering PhD student Jordan Thomas successfully transmitted quantum information through a fiberoptic cable carrying high-speed Internet traffic.

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Ted Sargent Named to National Academy of Inventors

Professor **Ted Sargent** is among 170 new fellows in the 2024 class who attained the highest professional distinction awarded solely to academic inventors.

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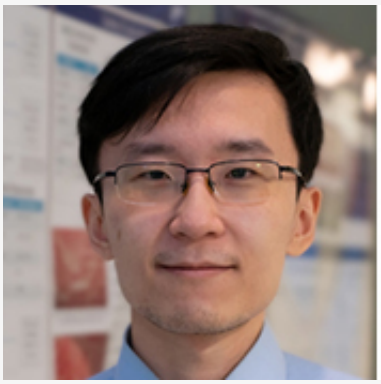

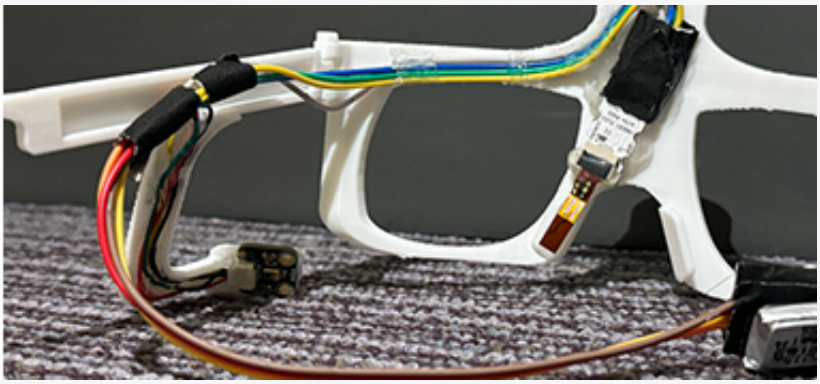

Improving Acoustic and Bone Conduction Speech Enhancement

Professor **Stephen Xia** and a team including computer engineering PhD students Yueyuan Sui and Junxi Xia developed an audio super-resolution model that enhances speech signals using neural networks.

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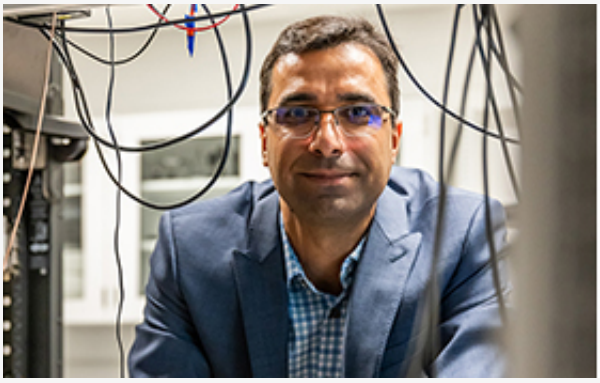

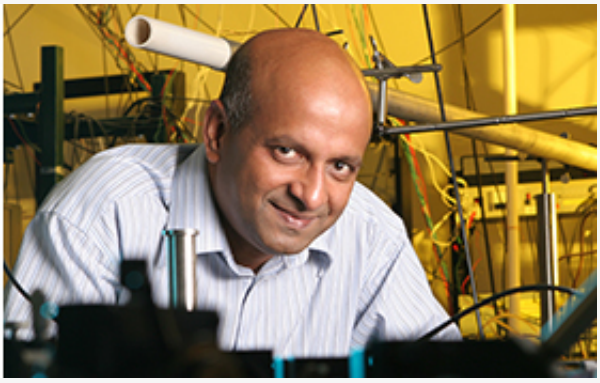

An Experimental Test of Quantum Nonlinearity

Supported by a grant from the W. M. Keck Foundation, Professors **Mahdi Hosseini** and **Selim Shahriar** aim to build and test an ultra-sensitive optomechanical system to determine whether quantum mechanics is linear or non-linear and whether gravity behaves classically or quantum mechanically.

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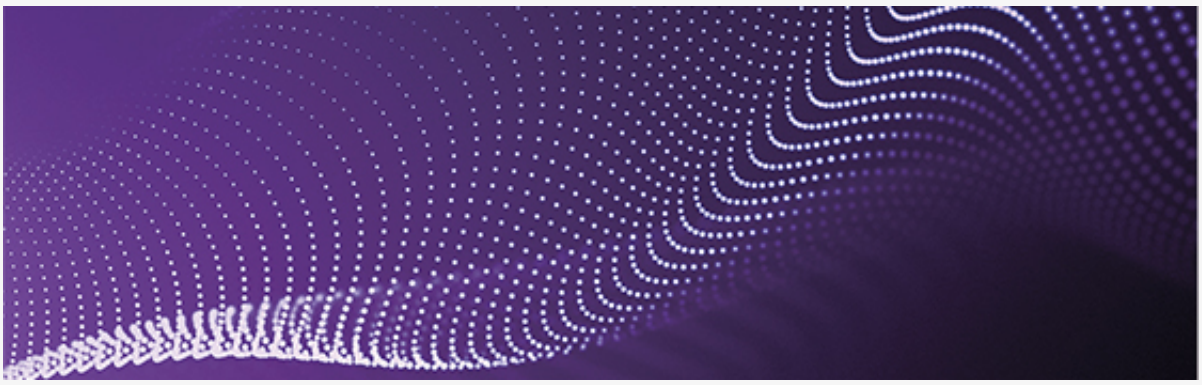

Going Quantum

Northwestern Engineering researchers, including Professors **Mahdi Hosseini**, **Pedram Khalili**, **Prem Kumar**, and **Kate Smith,** are collaborating to harness the extraordinary phenomena that underlie the origin and structure of the universe.

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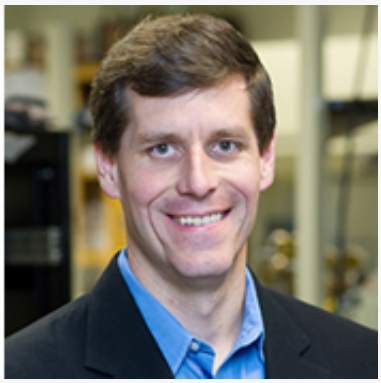

Synthesis of 2D Copper Boride Unlocks New Class of Advanced Materials

The scalable method for creating 2D copper boride developed by Professor **Mark Hersam** could lead to breakthroughs in energy and computing technologies.

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In Remembrance

Professor Emeritus Horace Yuen Passes Away

A leader in physics- and mathematics-based quantum and classical cryptography, Professor Emeritus Horace Yuen passed away on January 16.

Department Honors, Awards, and Announcements

Professor **Karan Ahuja** and the Google Android XR team won an **ACM SIGCHI Special Recognition Award** for pioneering the interaction framework of the operating system through exemplary industry-academia collaboration. Ahuja also received a **Ryan Family Research Acceleration Fund Award** to develop scalable, accessible motion-capture technology to unlock next-generation consumer health applications.

Professor **Nivedita Arora** was named an '**Emerging Rockstar**' by *IEEE Pervasive Computing* magazine.

Postdoc **Federico Bobbio** won the Best Paper Award at the 2025 IEEE International Symposium on Dynamic Spectrum Access Networks for joint work with Professors **Randy Berry** and **Michael Honig**.

Professors **Mark Hersam**, **John Rogers**, and **Ted Sargent** were named in the **Highly Cited Researchers 2024 List** by Clarivate.

Electrical Engineering alum **Russell Taylor Johns** ('82) is one of 128 members of the **National Academy of Engineering Class of 2025**.

In joint work with Professor **Igor Kadota**, master's degree student **Yubo Zhang** and visiting student **Pedro Botelho** won the **Best Student Paper Award** at the 23rd International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks.

Electrical engineering and computer engineering alum **Ryan Kastner** (MS ’00, ’99) received a **2025 CRA Undergraduate Research Faculty Mentoring Award**. Kastner is currently a professor of computer science and engineering at the University of California San Diego.

In joint work with Professor **Aggelos Katsaggelos**, visiting PhD student **Francisco Castro-Macías** won a **Best Student Paper Award** at the 2024 IEEE International Conference on Image Processing for introducing a probabilistic approach to address the challenging problem of image artifact deblurring.

Professor **Pedram Khalili** co-chaired the **2025 International Workshop on Ising Machines**, held in Evanston May 13 – 15.

Electrical engineering PhD student **Abdul Latif Bamba** was awarded a 2025 US National Science Foundation **Graduate Research Fellowship**.

Electrical engineering alum **Steven McLaughlin** (’85) has been **named the president** of the Cooper Union for the Advancement of Science and Art, effective July 1.

Electrical engineering alum **Maxim Raginsky** (BS/MS ’00, PhD ’02) has been elevated to an **Institute of Electrical and Electronics Engineers Fellow** in the class of 2025.

Professor **Manijeh Razeghi** served as the conference chair of the **International Materials Summit** in February.

Professor **Ted Sargent’s** lab addressed **perovskite solar cell durability challenges**, bringing the technology closer to commercial use. His team also

developed a new protective coating that significantly extends the life of perovskite solar cells.

Professor **Selim Shahriar** won a **2025 NASA Innovative Advanced Concepts** program award for his visionary idea to reconcile quantum mechanics with the theory of general relativity.

Nerdio, founded by computer engineering alum **Vadim Vladimirskiy** ('02, MBA '10), recently raised **$500 million in Series C funding**. The Chicago-based platform simplifies how companies deploy and manage Microsoft cloud technologies.

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