

Electrical and Computer Engineering

FROM THE CHAIR / Summer 2024

Dear friends and colleagues,

As I write this, it is the start of summer after a busy and exciting academic year for Northwestern Engineering's Department of Electrical and Computer Engineering (ECE).

Our faculty and students continued to produce groundbreaking research on topics such as health monitoring, electrical tomography, machine learning, and microelectronics — some of which you can read about below.

We also list the many honors and awards earned by members of the ECE community. I want to highlight two of these here. One of our newest faculty members, Professor **Nivedita Arora**, won the 2024 ACM Doctoral Dissertation Award. In addition, Professor **Ilya Mikhelson** was named the Charles Deering McCormick Distinguished Professor of Instruction.

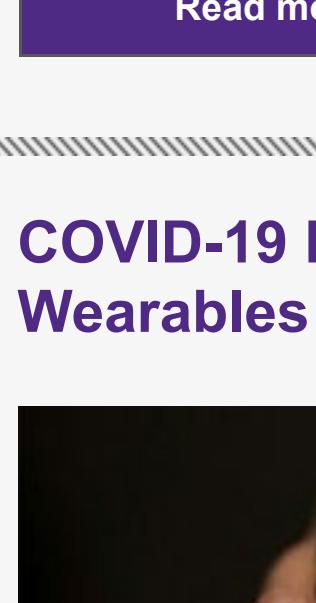
ECE faculty are also involved in many initiatives such as the newly funded **Midwest Carbon-Capture Hub**.

During the past year, we were also delighted to hire a new faculty member, **Jakub Szefer**, who works on computer architecture and hardware security.

On a more somber note, I want to acknowledge the passing of two emeritus faculty, Professor **Gordon Murphy** and Professor **Bruce Wessels**, both of whom previously served as chair of the department.

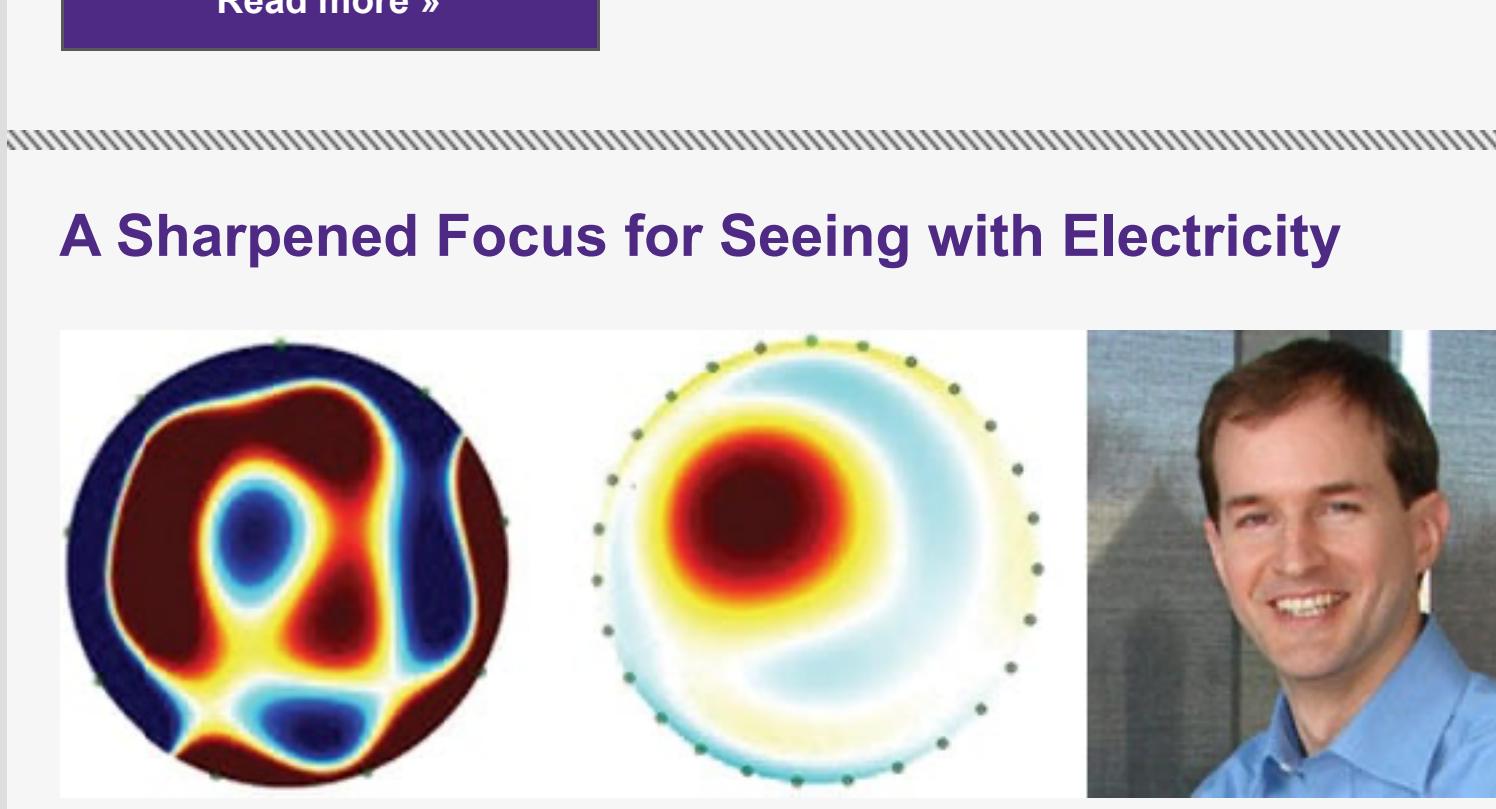
I wish everyone an enjoyable summer and hope you stay in touch.

Warmest regards,



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

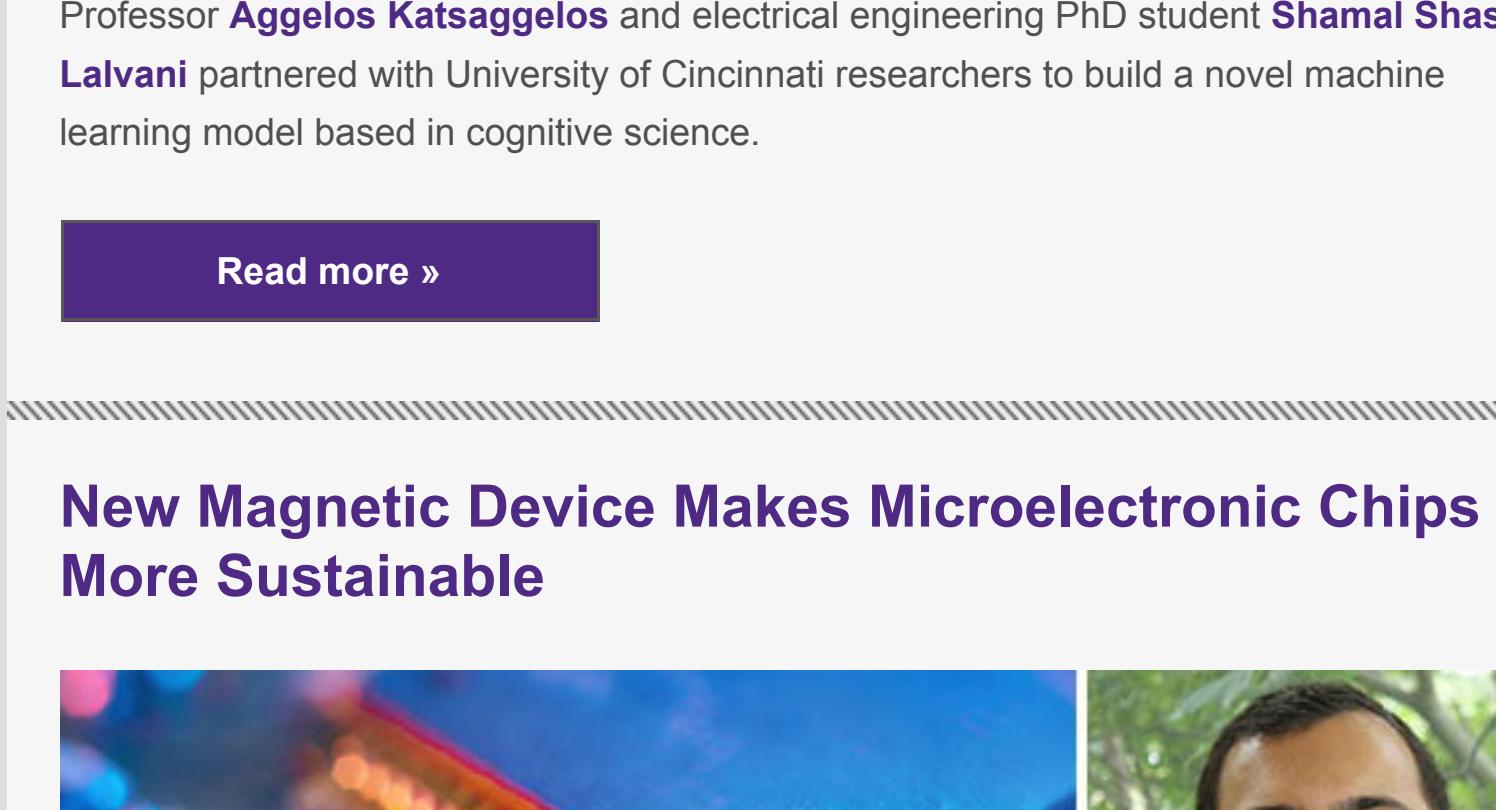
Nivedita Arora Wins 2024 ACM Doctoral Dissertation Award



In recognition of her superior research in computer science and engineering, Professor **Nivedita Arora** earned the 2024 Association for Computing Machinery Doctoral Dissertation Award.

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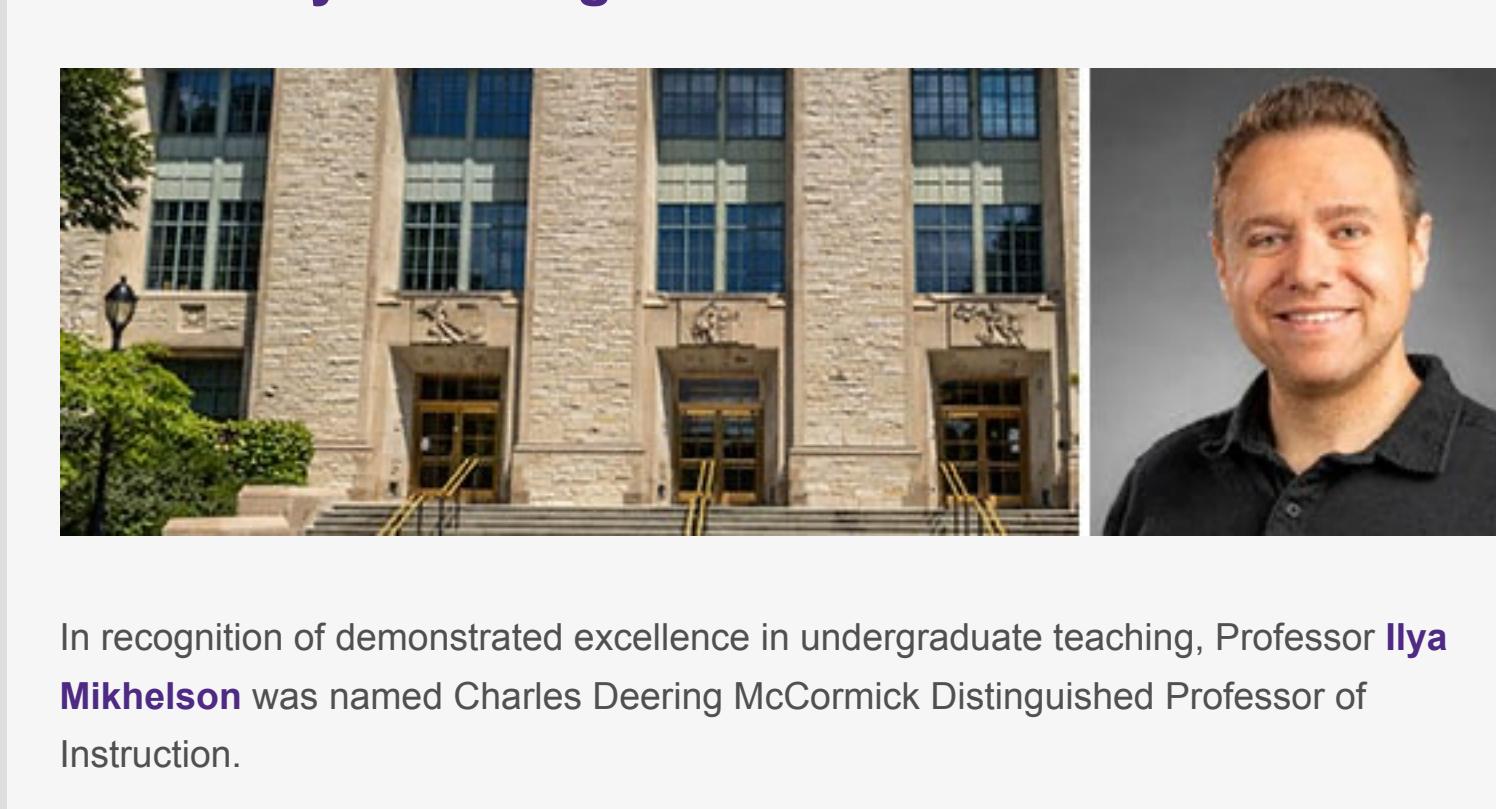
COVID-19 Pandemic Changed Attitudes toward Wearables



A study by computer engineering PhD candidate **Stefany Cruz** found that low-income Hispanic/Latine individuals have grown more receptive to health-monitoring technology.

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A Sharpened Focus for Seeing with Electricity



A new algorithm developed by Professor **Matthew Grayson** improves the quality of electrically measured tomographic images.

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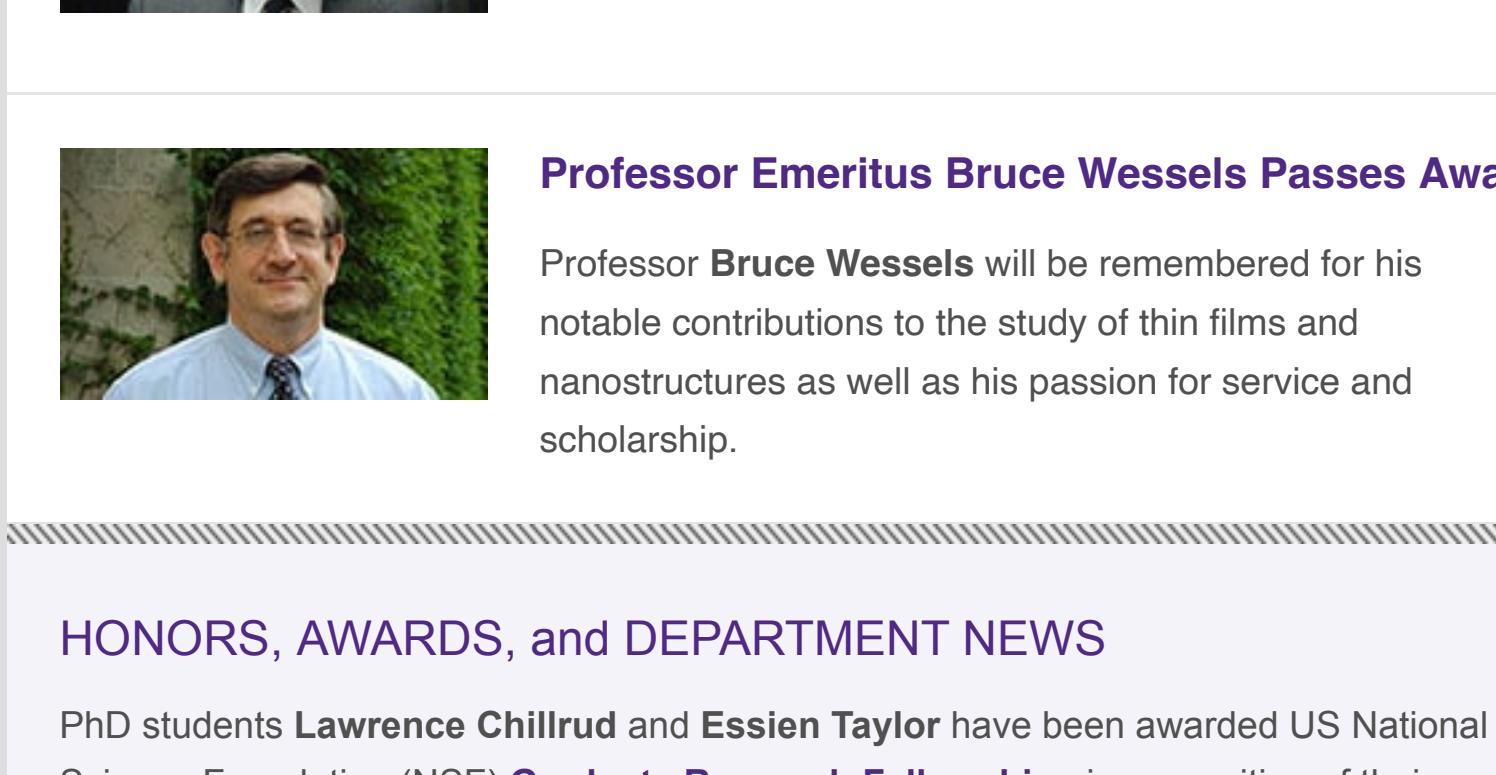
New AI Tool Predicts COVID-19 Vaccine Uptake



Professor **Aggelos Katsaggelos** and electrical engineering PhD student **Shama Shashi Lalvani** partnered with University of Cincinnati researchers to build a novel machine learning model based in cognitive science.

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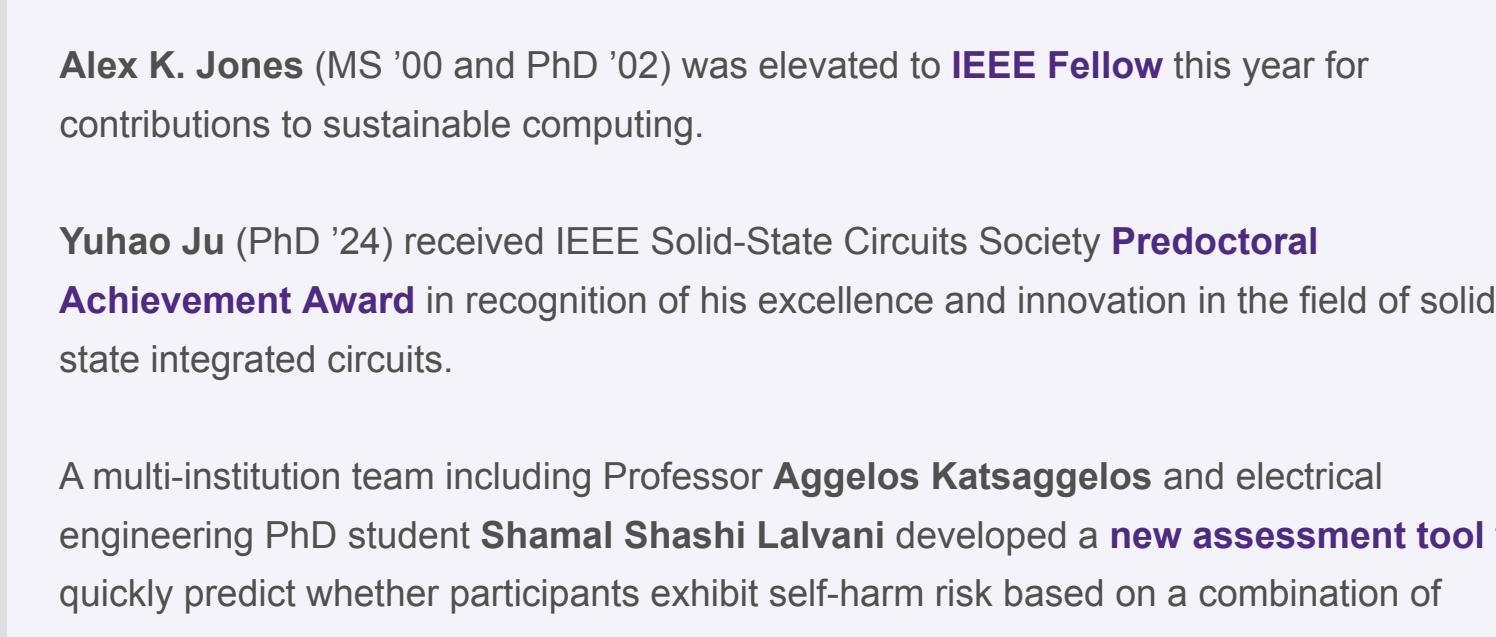
New Magnetic Device Makes Microelectronic Chips More Sustainable



An invention by Professor **Pedram Khalili** makes it possible to read data from antiferromagnetic materials and could allow chips to work faster while fitting more data in a smaller space.

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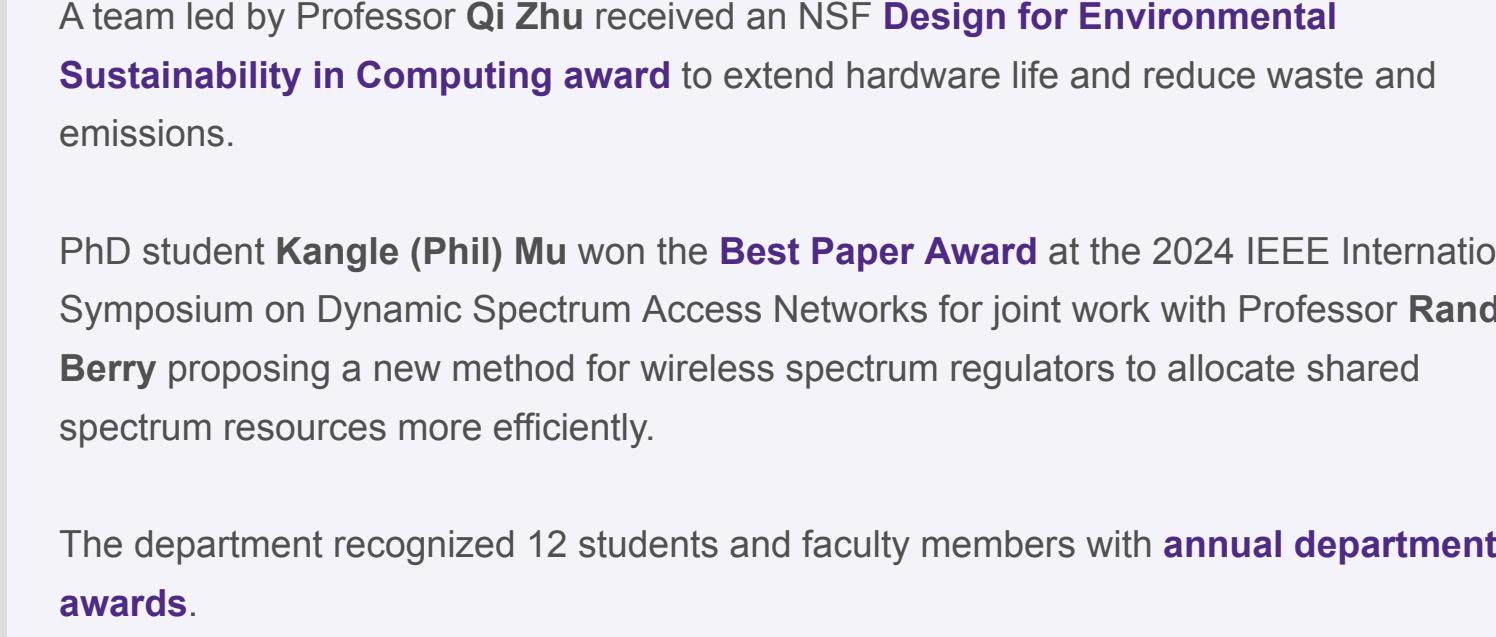
Professor Ilya Mikhelson Honored with 2024 University Teaching Award



In recognition of demonstrated excellence in undergraduate teaching, Professor **Ilya Mikhelson** was named Charles Deering McCormick Distinguished Professor of Instruction.

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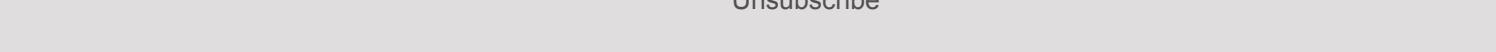
Northwestern to Lead Midwestern Carbon-Capture Hub



Professor **Ted Sargent** is the co-principal investigator of the nearly \$4 million project to test the feasibility of direct air capture technologies.

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Jakub Szefer Joins ECE Faculty Team



Professor **Jakub Szefer** will join Northwestern Engineering in January 2025 as an associate professor of electrical and computer engineering.

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In Remembrance

A leader in the field of automatic control, Professor Gordon Murphy passed away in November 2023.

Professor Emeritus Bruce Wessels will be remembered for his notable contributions to the study of thin films and nanoelectronics as well as his passion for service and scholarship.

HONORS, AWARDS, and DEPARTMENT NEWS

Northwestern Engineering students Lawrence Chilko and Esean Taylor have been recognized with National Science Foundation (NSF) Graduate Research Fellowships in recognition of their demonstrated potential for significant research achievements.

Northwestern Engineering team, including electrical engineering undergraduate student Kaitlynne Visch and graduate student Imane Choueiri, received the 2023 NASA Breakthrough, Innovative and Game-Changing Challenge Award.

Professors Randy Freeman and Ermin Wei served as the co-organizers of the 10th Midwest Workshop on Control and Game Theory, hosted at Northwestern in April.

Professor Jie Gu and members of his Very Large-Scale Integration Lab presented three papers and one live demonstration on brain-machine-interface at the 2024 IEEE Conference on Solid-State Circuits.

Professors Mark Hersam, John A. Rogers, and Ted Sargent were named among the global 'Highly Cited Researchers' for 2023 by Clarivate.

Alex K. Jones (MS '00 and PhD '02) was elevated to IEEE Fellow this year for contributions to sustainable computing.

Aiyou Ju (PhD '24) received an IEEE Solid-State Circuits Society **Postdoctoral Achievement Award** in recognition of his excellence and innovation in the field of solid-state integrated circuits.

A multi-institutional team, including Professor Aggelos Katsaggelos and electrical engineering graduate student Shama Shashi Lalvani, developed a new assessment tool to quickly predict whether participants exhibit self-harm risk based on a combination of machine learning and behavioral data.

Professor Pedram Khalili was appointed a 2024 IEEE **Nanotechnology Council Distinguished Lecturer**.

Professor Prem Kumar was appointed co-chair of the National Academies' **Committee on Atomic, Molecular, and Optical Sciences**.

Professors Prem Kumar and Nivedita Arora opened a dialogue on sustainable quantum technologies at the Quantum Economic Development Consortium **plenary meeting** hosted at the University in March.

Professor Manish Razeghi served as chair of the **5th International Conference On Materials Science & Engineering**.

A team led by Professor Qi Zhu received an NSF **Design for Environmental Sustainability in Computing award** to extend hardware life and reduce waste and emissions.

PhD student Kangle (Phil) Mu won the **Best Paper Award** at the 2024 IEEE International Symposium on Dynamic Spectrum Access Networks for joint work with Professor Randy Berry proposing a new method for wireless spectrum regulators to allocate shared spectrum resources more efficiently.

The department recognized 12 students and faculty members with **annual department awards**.

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