

FROM THE CHAIR / Fall 2024

Dear friends,

I am delighted to share some recent news from Northwestern Engineering's Department of Electrical and Computer Engineering.

Our faculty are involved in several new large research projects, including a **National AI Research Institute in Astronomy** jointly funded by the US National Science Foundation and the Simons Foundation in addition to an **Energy Frontier Research Center** through the US Department of Energy.

Our faculty and students continue to develop exciting research addressing topics including **warming Mars** for human habitation, using sensors to **improve the health of manufacturing workers**, and **improving solar cells**. Over the summer, our faculty hosted two summer schools at Northwestern – one on **quantum technologies** and one on a new **design tool for machine learning hardware implementations**. We also launched a new **tech-focused career fair** this fall. This is just a sample of all the great work being done by our department.

I also want to highlight a new memorial fund established in honor of the late Professor Larry Henschen through donations by alumni and friends. Larry was a dear colleague who clearly had a lasting impact on many of the people he worked with.

Finally, I want to note that this year we have an **open faculty search** in the quantum computing area jointly with Northwestern Computer Science. Please share the opportunity with anyone that may be interested.

I hope that you are well and stay in touch.

Best,



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

Professor Lawrence Joseph Henschen Memorial Fund

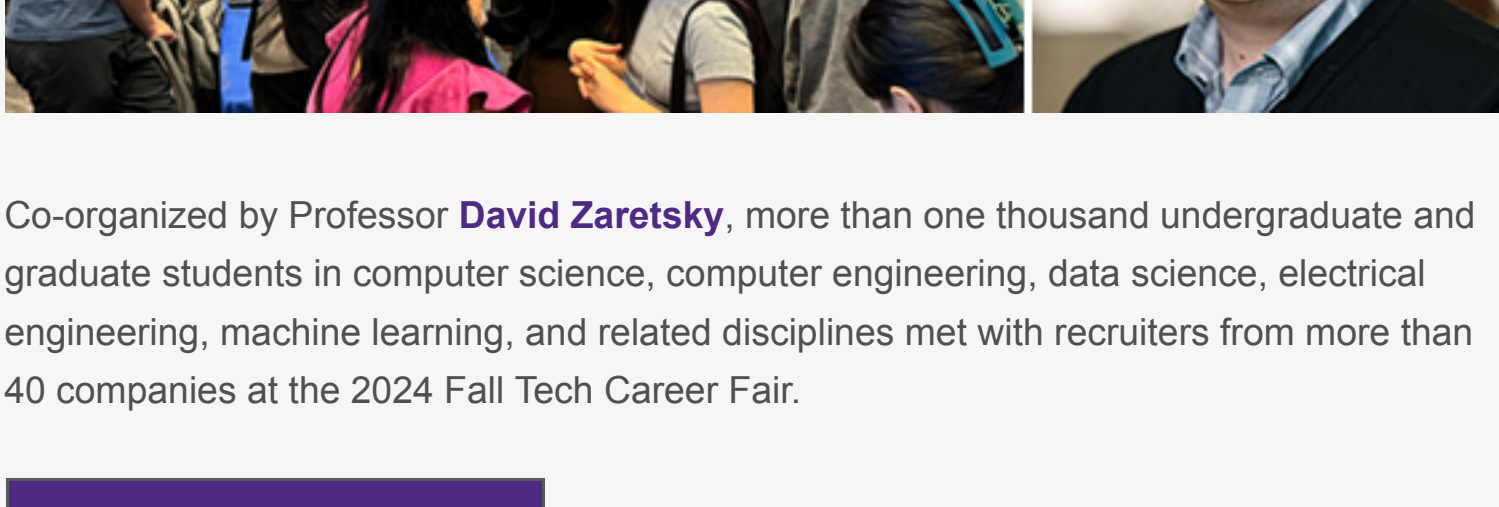
Remembered as a dedicated teacher, a prolific researcher, and a beloved member of the McCormick community, a memorial fund has been established in honor of professor emeritus Lawrence J. Henschen. The Professor Lawrence Joseph Henschen Memorial Fund will provide financial assistance to doctoral students at Northwestern Engineering.

From 2000 to 2009, Henschen served as the associate dean of students at Northwestern's The Graduate School. As the graduate director of EECS/ECE from 1989 to 2001, he was responsible for the department's graduate curriculum, policy, and application process. From 1980 to 1996, Henschen was the chair of the Computer and Information Studies program at Northwestern's Weinberg School of Arts and Sciences.

Between 1975 and 2001, Henschen supervised 69 PhD students. He earned multiple teaching accolades during his career, including the McCormick TECH Teaching Award (1983), the Illinois Gamma Chapter of Tau Beta Pi outstanding teacher award (1984), and the Charles Deering McCormick Professor of Teaching Excellence award (2004). In 2012, The Graduate School bestowed Henschen with a faculty award for diversity in recognition of his contributions to an environment which values diverse backgrounds, approaches, and perspectives.

If you are interested in contributing to this fund, you can **give online** by selecting "Other" and entering **Professor Lawrence Joseph Henschen Memorial Fund** in the gift designation section.

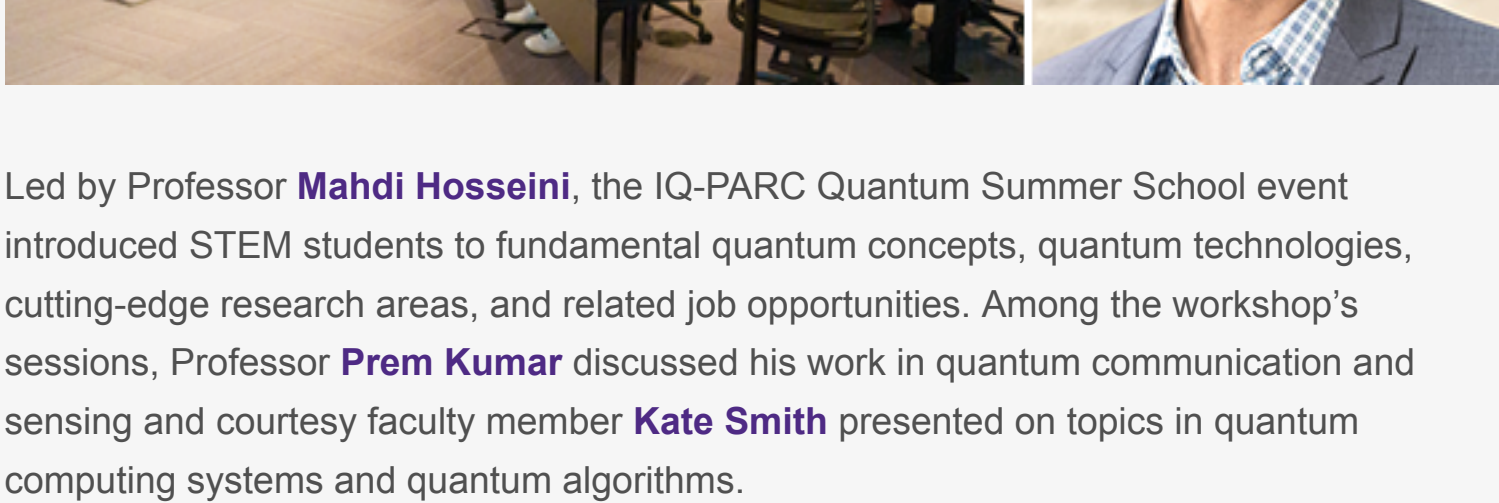
Fall Tech Career Fair Welcomes More than 40 Companies



Co-organized by Professor **David Zaretsky**, more than one thousand undergraduate and graduate students in computer science, computer engineering, data science, electrical engineering, machine learning, and related disciplines met with recruiters from more than 40 companies at the 2024 Fall Tech Career Fair.

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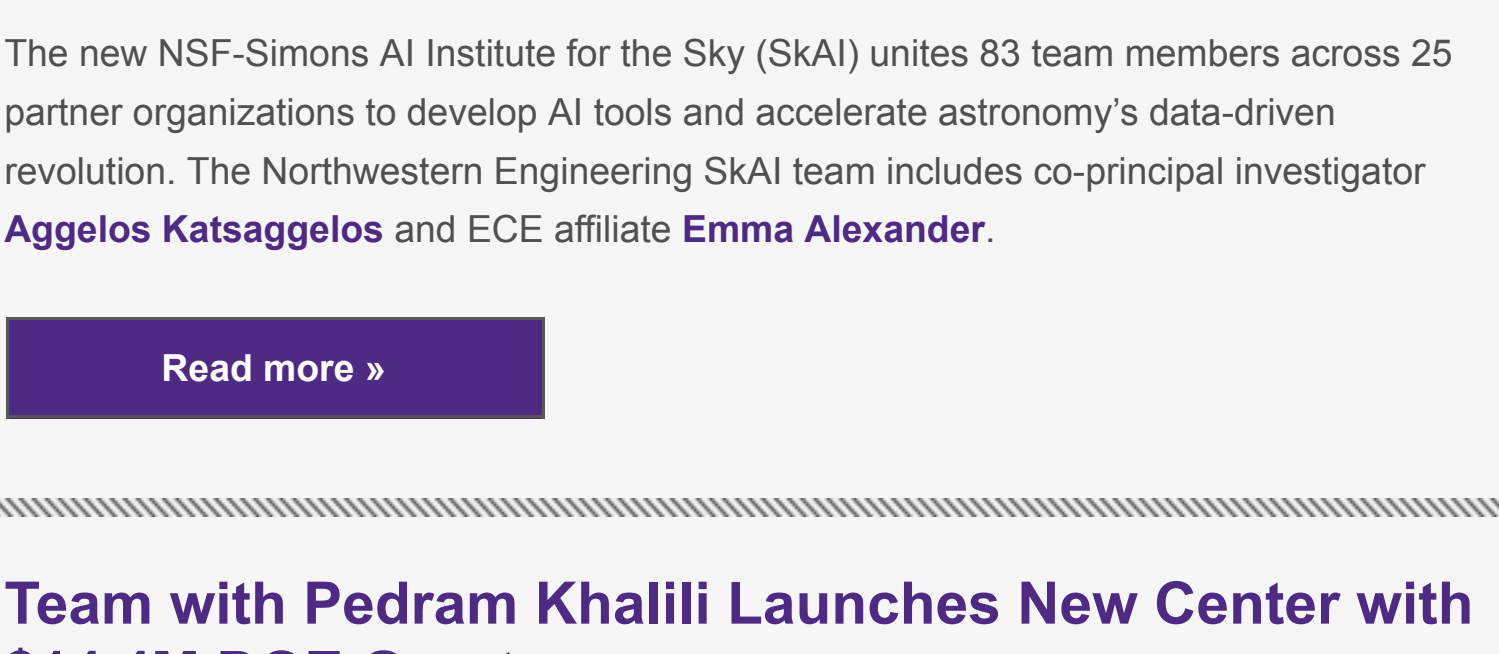
Emerging Technologies through Engineering the Sub-Atomic Quantum World



Led by Professor **Mahdi Hosseini**, the IQ-PARC Quantum Summer School event introduced STEM students to fundamental quantum concepts, quantum technologies, cutting-edge research areas, and related job opportunities. Among the workshop's sessions, Professor **Prem Kumar** discussed his work in quantum communication and sensing and courtesy faculty member **Kate Smith** presented on topics in quantum computing systems and quantum algorithms.

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Northwestern to Lead \$20 Million National AI Research Institute in Astronomy



The new NSF-Simons AI Institute for the Sky (SKAI) unites 83 team members across 25 partner organizations to develop AI tools and accelerate astronomy's data-driven revolution. The Northwestern Engineering SKAI team includes co-principal investigator **Angelos Katsaggelos** and ECE affiliate **Emma Alexander**.

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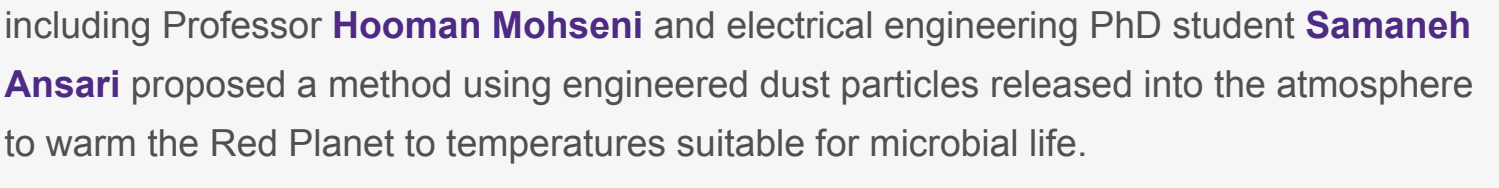
Team with Pedram Khalili Launches New Center with \$14.4M DOE Grant



Professor **Pedram Khalili** and the Center for Energy Efficient Magnonics team aim to advance a new approach to microelectronics manufacturing based on transmitting information via spin waves versus traditional metallic interconnects.

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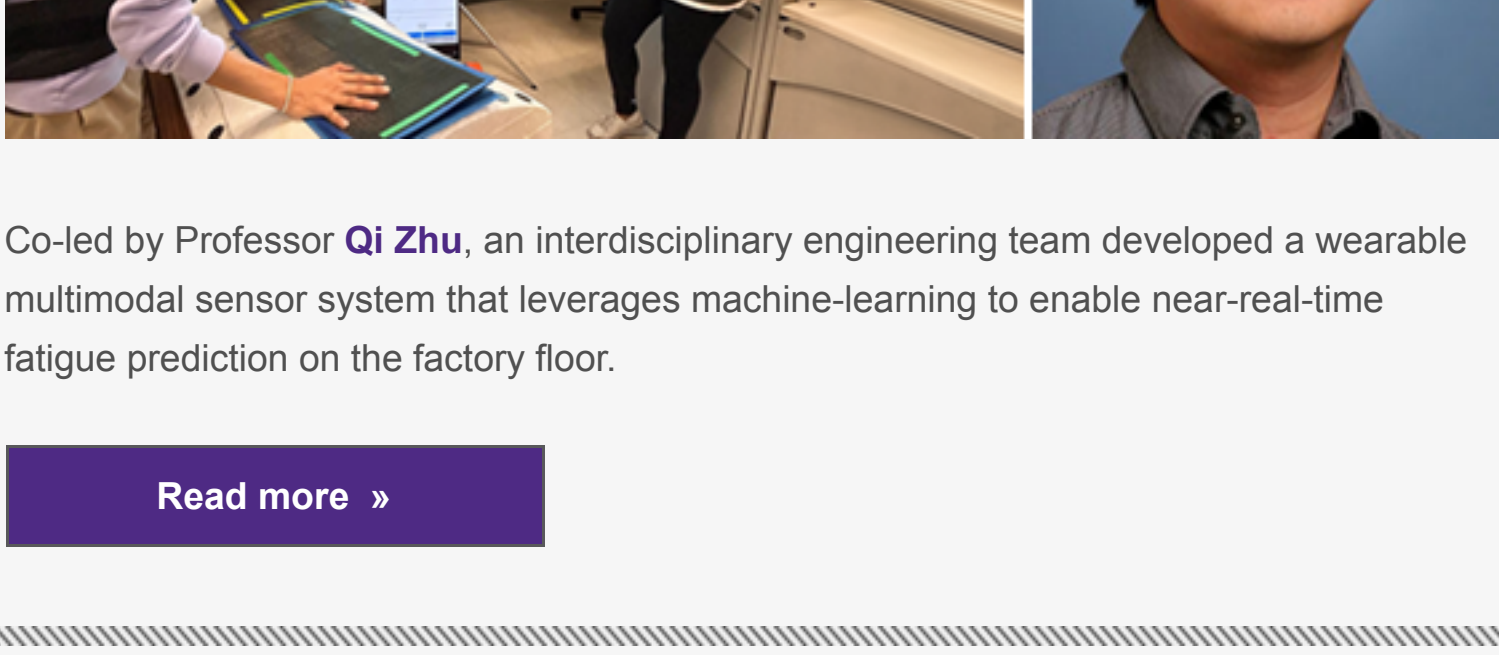
How We Could Warm Mars



In a first step toward making Mars habitable, a multi-institution team of researchers including Professor **Hooman Mohseni** and electrical engineering PhD student **Samaneh Ansari** proposed a method using engineered dust particles released into the atmosphere to warm the Red Planet to temperatures suitable for microbial life.

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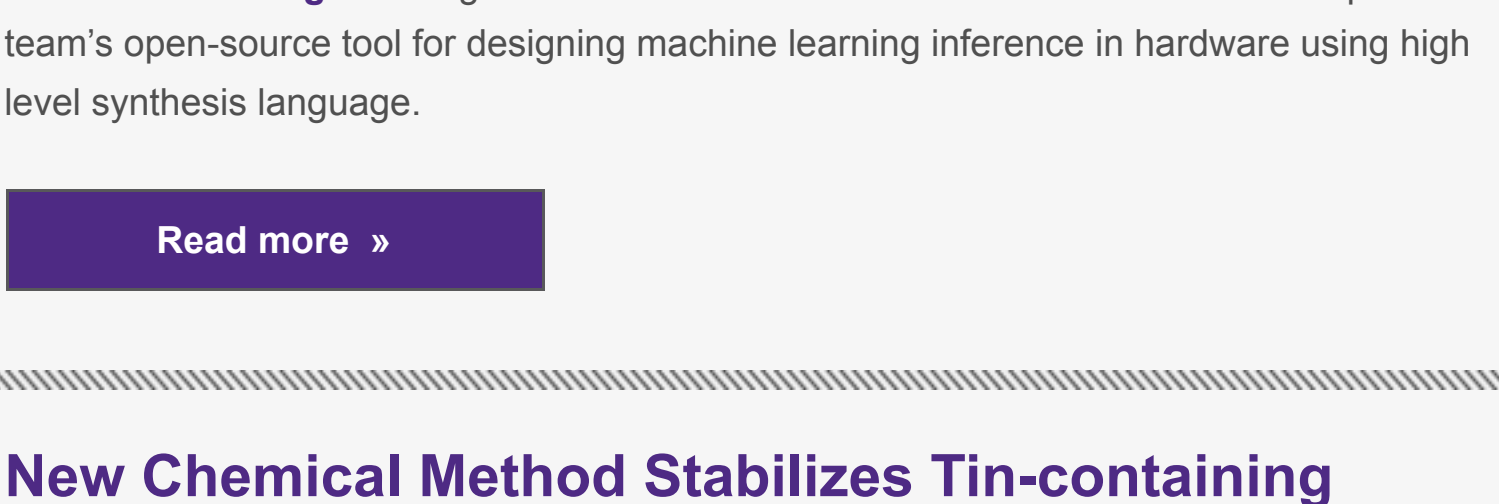
Improving the Occupational Health of Manufacturing Workers



Co-led by Professor **Qi Zhu**, an interdisciplinary engineering team developed a wearable multimodal sensor system that leverages machine-learning to enable near-real-time fatigue prediction on the factory floor.

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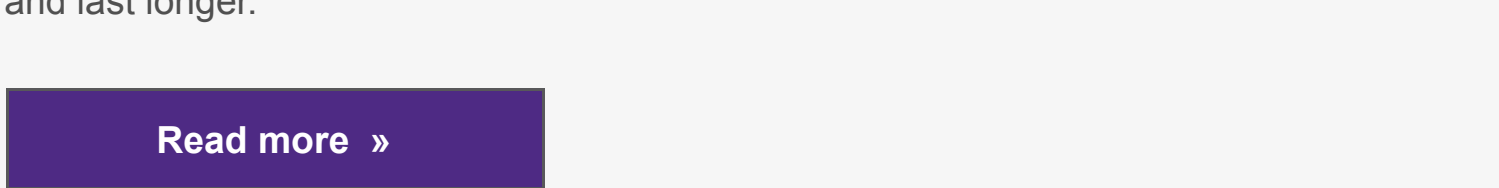
hls4ml Summer School Offers Students Training in Edge-AI Hardware Accelerators



Professor **Seda Ogrenci** organized a hands-on summer school for students to explore her team's open-source tool for designing machine learning inference in hardware using high level synthesis language.

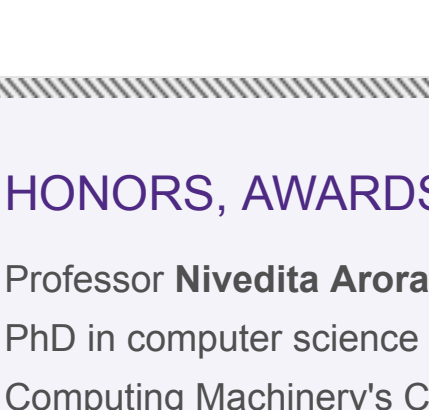
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New Chemical Method Stabilizes Tin-containing Perovskites



By adding diamine, Professor **Ted Sargent** and a team of researchers achieved a better surficial tin-lead balance and stable barrier layers, which could help solar cells work better and last longer.

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Career Opportunity: Tenure-track Joint Faculty Position in Quantum Computing

The Departments of Computer Science and Electrical and Computer Engineering seek candidates for a **Jointly-appointed assistant professor** who will help build the future of quantum computing and quantum information science at Northwestern University.

HONORS, AWARDS, and DEPARTMENT NEWS

Professor **Nivedita Arora** shared **lessons learned** from her six-year journey earning a PhD in computer science at the Georgia Institute of Technology with the Association for Computing Machinery's Council on Women in Computing. She was also featured in the **"People of ACM"** series.

In joint work with Professor **Randy Berry** and Professor **Igor Kadota**, PhD students **Kangle (Phil) Mu** and **Zongyu Xie** won the **Best Student Paper Award** at the 22nd International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks.

Empowered by Northwestern Engineering Global Initiatives director **Matthew Grayson's** Four Corners program, climate scientists at Northwestern University and the University of Hamburg look to **drive student research** and propel efforts to combat climate change.

Professor **Jie Gu** and members of his Very Large-Scale Integration Lab team won the **Design Contest Award** at the premier ACM/IEEE International Symposium on Low Power Electronics and Design.

Professor **Mahdi Hosseini** has received the Defense Advanced Research Projects Agency **Young Faculty Award**.

Professor **Mark Hersam** discussed sustainable, energy-efficient artificial intelligence at the **TEDxChicago** event on September 27 and described his lab's work developing next-generation nanoelectronic devices to advance the potential of neuromorphic (i.e., brain-like) computing.

Professor **Pedram Khalili** was a **keynote speaker** at IEEE-NANO in July, the flagship conference series of the IEEE Nanotechnology Council.

Payal Mohapatra, a PhD candidate in computer engineering, was one of 70 invited participants at **Electrical Engineering and Computer Science (EECS) Rising Stars Workshop 2024**, an intensive workshop designed for graduate students and postdocs of historically marginalized or underrepresented genders.

Snow Tseng (PhD '05), distinguished professor of electrical engineering and computer science at National Taiwan University, **co-chaired** the 2024 Gordon Research Conference on Optics and Photonics in Medicine and Biology, held in July at Bates College in Lewiston, Maine.