

Materials Science and Engineering

FROM THE CHAIR / Fall 2023

Dear friends and colleagues,

It is a great honor to write to you for the first time as chair of the Department of Materials Science and Engineering. First and foremost, I want to acknowledge outgoing chair Peter Voorhees for his tireless efforts on behalf of the department. Peter has positioned the department for significant growth in the future through multiple key hires including assistant professors Cecile Chazot (arriving in January 2023), David Barton (arriving in January 2024), and Jennifer Fowlie (arriving in September 2024). Peter also expanded our instructional faculty by recruiting one of our distinguished alumni, Rajan Kumar (BS '14), back to the department as an assistant professor of instruction (arriving in November 2023). Peter has left big shoes to fill – but with his mentorship and counsel, I look forward to the opportunity to follow his lead and continue expanding the scope and impact of the department.

I am thrilled to report many well-deserved honors for our faculty and students over the past few months. All three of our current assistant professors have received named titles from the McCormick School of Engineering: Cecile Chazot is now the Julia Weertman Junior Professor of Materials Science and Engineering, Ian McCue is now the Morris E. Fine Junior Professor in Materials and Manufacturing, and Ryan Truby is now the June and Donald Brewer Junior Professor of Materials Science and Engineering. Not to be outdone, our senior faculty members have also collected significant honors: James Rondinelli is now the Walter Dill Scott Professor of Materials Science and Engineering, Laurence Marks received a Fulbright US Scholar Fellowship, and Teri Odom was elected to the National Academy of Sciences.

I am most proud of our amazing students who seemingly achieve significant external recognitions everywhere they go. Chris Hareland won the best paper award in CALPHAD, Lindsay Chaney won the best poster award at the FLEX 2023 Conference in San Francisco, and Lidia Kuo received the 2023 Dorothy M. and Earl S. Hoffman Scholarship from the American Vacuum Society.

In addition to the junior faculty mentioned above, I am happy to welcome new senior members of our core faculty. In recognition of his substantial contributions to our department, Professor Jonathan Rivnay has been elevated from a courtesy faculty member to a core faculty member effective this September. Alum Chris Schuh (PhD '01) has also returned to campus as Dean of the McCormick School of Engineering and John G. Searle Professor of Materials Science and Engineering as of August. I very much look forward to working closely with Chris in both of our new roles.

Under the leadership of our department business administrator Marilyn Hall, the department office is undergoing significant restructuring that will lead to improved efficiencies for all department operations. In particular, the department office now has three teams focused on administration (led by Willie James), finance (led by Laura Olson), and research (led by Sharlene Andrewin). New hires are actively being recruited and onboarded to all of these teams. Please join me in thanking all department staff for their hard work, resilience, and adaptability during this time of change.

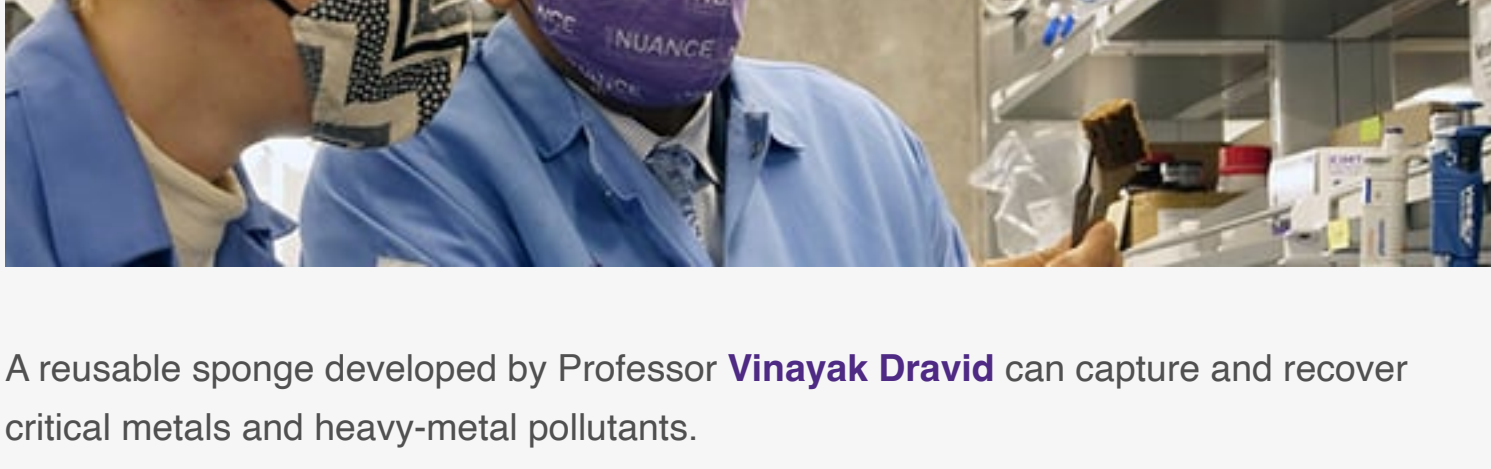
Looking to the future, the department has multiple major new externally funded grants that will drive our research into new and exciting directions. Most prominently, the Materials Research Science and Engineering Center (MRSEC) has received a six-year, \$18 million grant from the National Science Foundation. With this grant, the MRSEC will initiate two interdisciplinary research groups focused on synthetic materials biology and iontronic materials that have broad implications for sustainable agriculture, water purification, soft robotics, and neuromorphic computing. Additional recent multi-million dollar research awards include an Emerging Frontiers in Research and Innovation Grant from the National Science Foundation entitled "Emulating Cerebellar Temporally Coherent Signaling for Ultraefficient Emergent Prediction" and a Designing Materials to Revolutionize and Engineer our Future Grant from the National Science Foundation entitled "Accelerated Design, Discovery, and Deployment of Electronic Phase Transitions." Indicative of our interdisciplinary leadership role on campus, these grants not only benefit the materials science and engineering department but also include faculty with appointments in 12 departments across the McCormick School of Engineering and the Weinberg College of Arts and Sciences.

In conclusion, I encourage you to dig deeper into all of the great things that are happening in our department in the newsletter below. For our students, faculty, and staff, please note that I will have an open-door policy as chair, so do not hesitate to stop by my office or contact me anytime. For our alumni and friends, I also hope to hear from you and see you on campus soon.



Mark Hersam
Walter P. Murphy Professor and Chair
Department of Materials Science and Engineering
McCormick School of Engineering

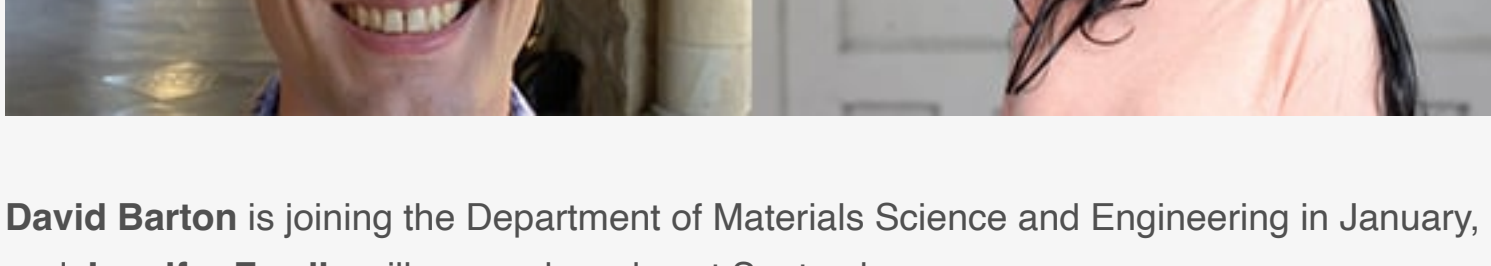
Metal-filtering Sponge Removes Lead from Water



A reusable sponge developed by Professor **Vinayak David** can capture and recover critical metals and heavy-metal pollutants.

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MSE Welcomes Barton, Fowlie to Faculty



David Barton is joining the Department of Materials Science and Engineering in January, and **Jennifer Fowlie** will come aboard next September.

[Read about David »](#)

[Read about Jennifer »](#)

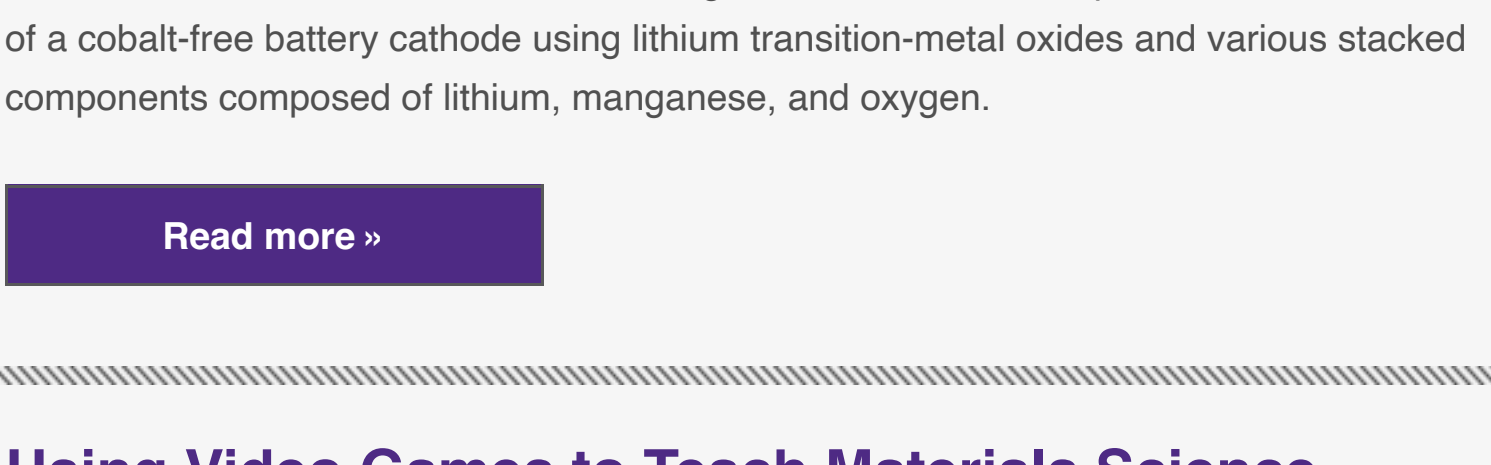
McCormick Researchers Connect with Counterparts in Africa for JUAMI 2023



Led by Professor **Sossina Haile**, the Joint Undertaking for an African Materials Institute held its latest program in Kenya in June, focusing on sustainable energy.

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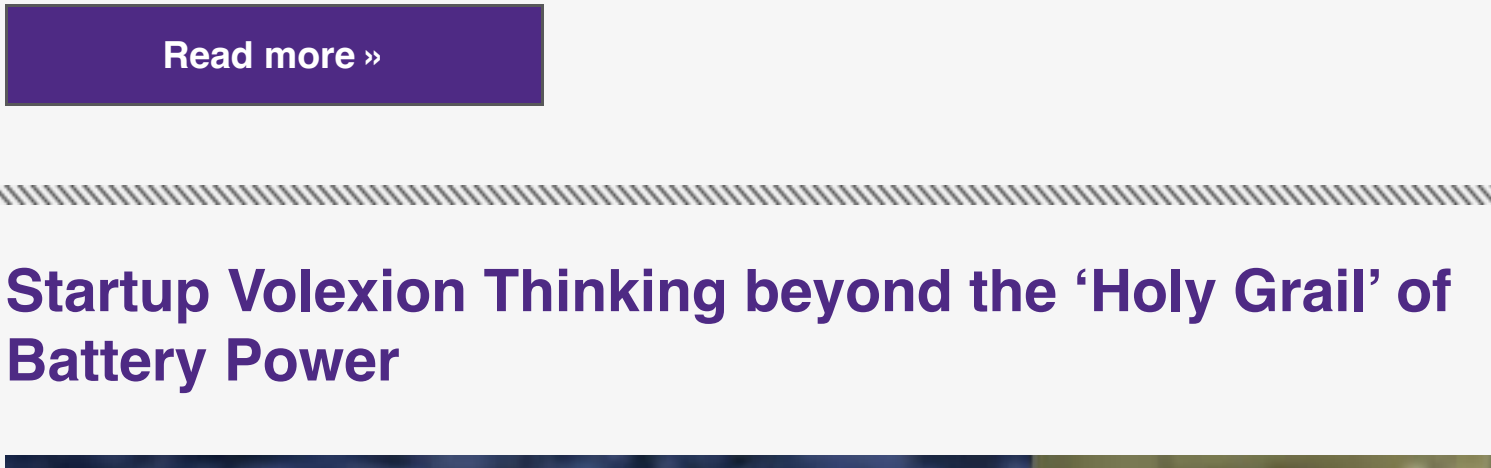
Adding Life to Lithium-Ion Batteries



Professor **Chris Wolverton** and his colleagues demonstrated the potential effectiveness of a cobalt-free battery cathode using lithium transition-metal oxides and various stacked components composed of lithium, manganese, and oxygen.

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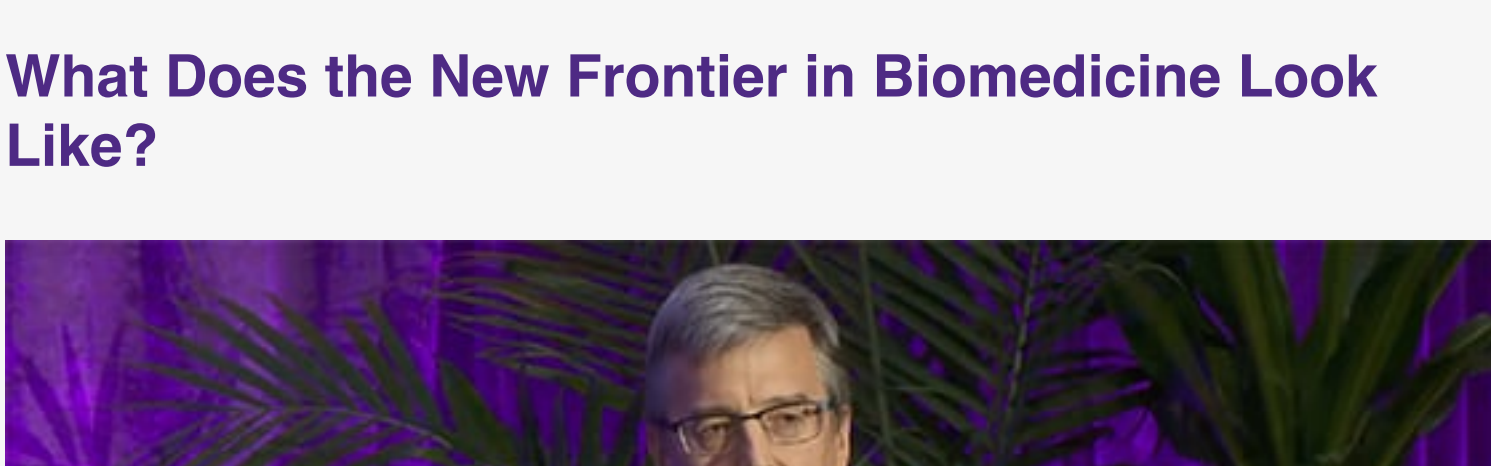
Using Video Games to Teach Materials Science



Professor **David Dunand** and an interdisciplinary student team of materials science and computer science researchers are distilling technical materials science research concepts into fun and engaging video games to engage a broad audience.

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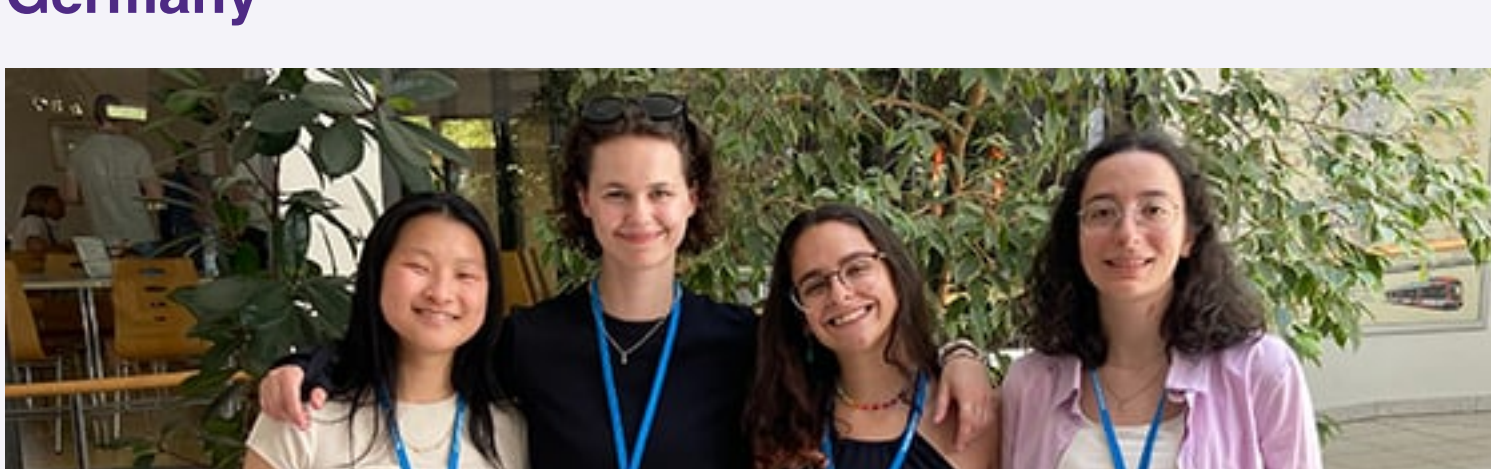
Startup Volexion Thinking beyond the 'Holy Grail' of Battery Power



Founded by Professor **Mark Hersam**, the spinoff company's cathode coating results in a safer battery that is packed with power.

[Read more »](#)

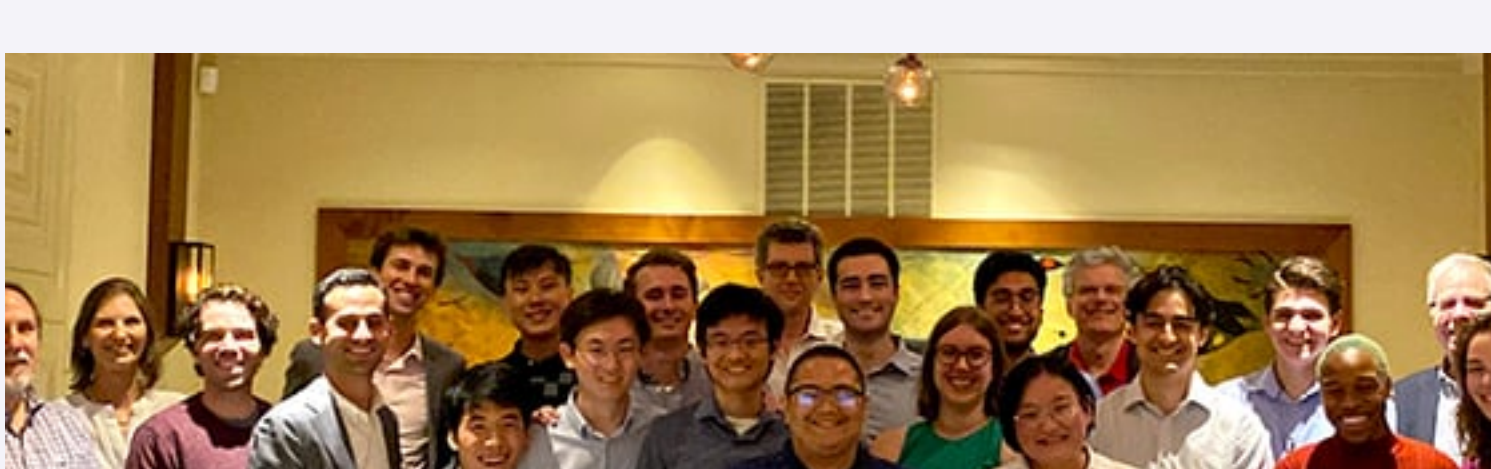
What Does the New Frontier in Biomedicine Look Like?



As part of presidential inauguration week, an expert panel including Professor **John Rogers** explored the topics of longevity, AI, regenerative medicine, bioelectronics, and new approaches to cancer treatment. [VIDEO](#)

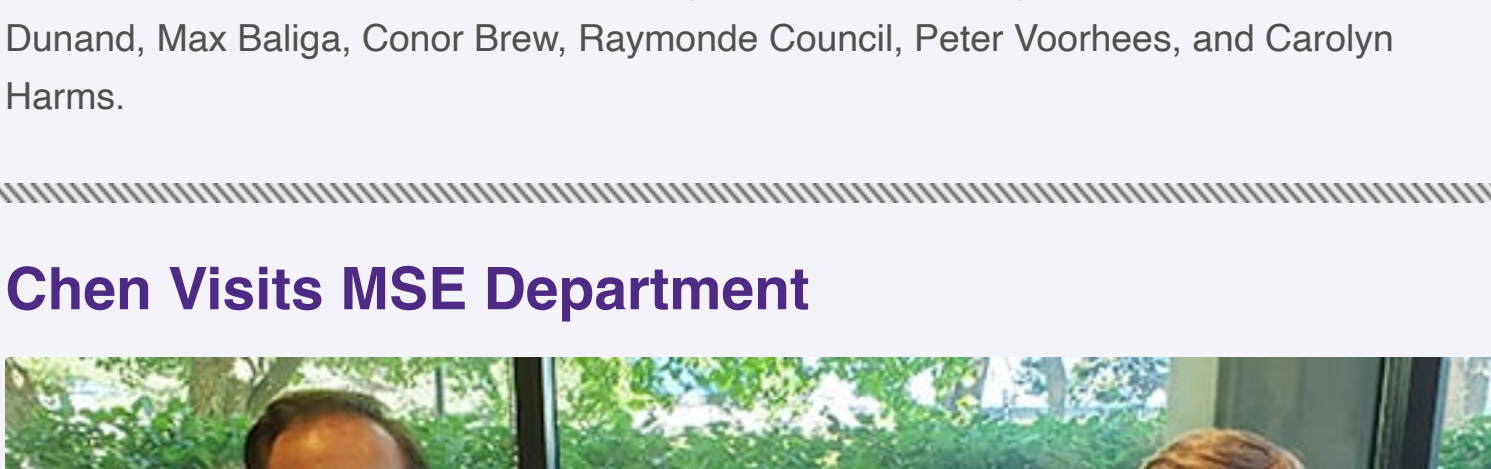
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Four MSE Students Conduct Summer Research in Germany



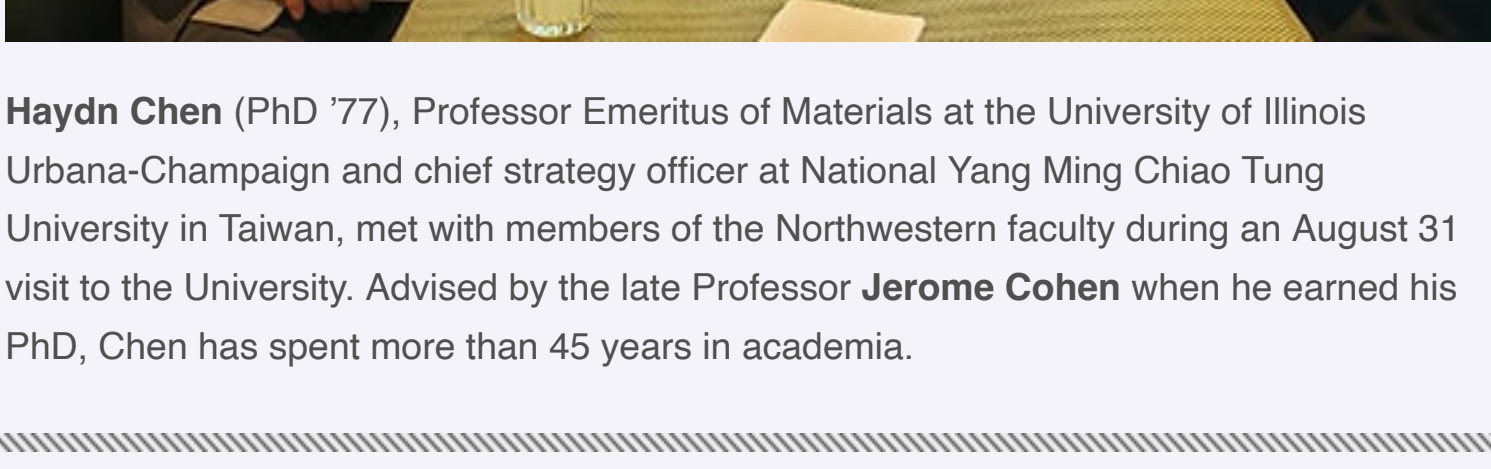
Sponsored by the DAAD-RISE program, undergraduate students (from left to right) **Janice Xie**, **Levi Hoogendorn**, **Juliana Davoglio Estradioto**, and **Ekin Senvardarli** spent the summer performing materials research in Germany. **Naat'anii Castillo**, not pictured, also participated in summer research in Germany sponsored by Northwestern's Summer Internship Grant Program.

MSE Celebrates Seniors



In June, the Class of 2023 and core department faculty instructors celebrated at a senior banquet. From left to right: Kenneth Shull, Kathleen Stair, Jon Emery, James Rondinelli, Ryan Truby, Hans Xu, Steven Ma, Davy Zeng, David Venator, Alex Tai, Derk Joester, Andre Tayamen, Aiden Weiser, Sarah Bogan, Saahir Ganti-Agrawal, Jazmyn Lu, David Dunand, Max Baliga, Conor Brew, Raymonde Council, Peter Voorhees, and Carolyn Harms.

Chen Visits MSE Department



Haydn Chen (PhD '77), Professor Emeritus of Materials at the University of Illinois Urbana-Champaign and chief strategy officer at National Yang Ming Chiao Tung University in Taiwan, met with members of the Northwestern faculty during an August 31 visit to the University. Advised by the late Professor **Jerome Cohen** when he earned his PhD, Chen has spent more than 45 years in academia.

MSE Faculty Earns Named Professorships

Professors **Cecile Chazot**, **Ian McCue**, **James Rondinelli**, and **Ryan Truby** earned named professorships. Chazot was named the Julia Weertman Professor in Materials Science and Engineering, McCue is now the Morris E. Fine Junior Professor in Materials and Manufacturing, Rondinelli was named the Walter Dill Scott Professor of Materials Science and Engineering, and Truby is the June and Donald Brewer Junior Professor of Materials Science and Engineering.

MSE Holds Workshop with KAIST

Members of the Northwestern MSE faculty and professors from the Korea Advanced Institute of Science and Technology (KAIST) held a workshop on July 19 at Cook Hall on the University's Evanston campus. The two institutions signed a memorandum of understanding to further their work together. The event included lectures from Northwestern faculty members **Erik Luijten**, **Peter Voorhees**, **Mark Hersam**, **James Rondinelli**, **Lincoln Lauhon**, and **Vinayak David**.

FACULTY NEWS

Zdeněk P. Bažant received the Murray Medal and presented the Murray Lecture at the recent Society of Experimental Mechanics Annual Meeting in Orlando. In addition, the ASME Applied Mechanics Division established the Zdeněk Bažant Medal for contributions to mechanics, to be given annually to researchers no more than 20 years after their highest degree.

Directed by **Mark Hersam**, the Materials Research Science and Engineering Center, Hersam also received the **Dorothy Ann and Clarence L. Ver Steeg Distinguished Research Fellowship Award** in recognition of his work that enhances the national and international reputation of the University.

Mercouri Kanatzidis won the Centenary Prize from the Royal Society of Chemistry in recognition of pioneering contributions to the synthesis and development of novel semiconducting halide perovskites for application in solar energy conversion, and for excellence in communication. In addition, the international Mineralogical Society named the new mineral discovered in Hungary *kanatzidisite*.

Laurence Marks received a **Fulbright US Scholar fellowship** from the US Department of State and the Fulbright Foreign Scholarship Board.

Chad Mirkin received an Honorary Doctorate of Science from the City University of Hong Kong.

Teri Odom was elected to the **National Academy of Sciences**.

John Rogers earned the 2024 Biomedical Engineering Award from the Institute of Electrical and Electronics Engineers, and the 2023 Sigma Xi William Procter Award for Scientific Achievement.

ALUMNI AND STUDENT NEWS

A paper co-written by PhD candidate **Chris Hareland** and adviser **Peter Voorhees** titled "Thermodynamic Coupling in the Computation of Dendrite Growth Kinetics for Multicomponent Alloys" won the award for the best paper published in 2022 in the *Calculation of PHase Diagrams* academic journal.

Chia Pao (Brian) Lee received the 2022-23 TA Award.

Michael Toriyama, of the Snyder research group, was awarded the Johannes and Julia Randall Weertman Graduate Fellowship, recognizing a PhD. candidate in materials science and engineering for her or his outstanding scholarly achievements and promise.

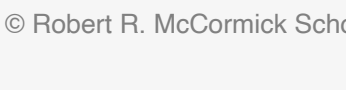
Karen Chen-Wiegart (PhD '11) was promoted to tenured associate professor at Stony Brook University.

Chamille Lescott (PhD '22), assistant professor of instruction in the Segal Design Institute and a McCormick first-year adviser, was awarded the 2022-23 Undergraduate Advising Award.

Don Lipkin ('91) started a new position as professor of materials science and engineering at Texas A&M.

FACTS & FIGURES

20+ National Academy memberships	7 Highly cited researchers by Clarivate Analytics	13 Affiliated research centers and institutes
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