Northwestern | McCORMICK SCHOOL OF ENGINEERING

Materials Science and Engineering

FROM THE CHAIR / Fall 2021

Dear Friends,

Fall is in the air. Students are back on campus, and after a long year and a half of Zooming, we are meeting them in person. Our newest cohorts include 37 PhD students and 49 MS students. We are very pleased to welcome them to Evanston!

In addition to reacclimating to the classroom, there are many other changes taking place in the department. I first want to thank Erik Luijten for his service and leadership as department chair. His tenure was marked by the challenges of a global pandemic and rising concerns about social injustice. His steady leadership that guided us through the difficult transition to remote learning is a model for future MSE chairs. Under his leadership and with help from many faculty, students, and alumni, we established new committees and procedures to work toward ensuring that scholars of all identities and backgrounds are welcome and will thrive in our department. Erik is now serving McCormick as associate dean of faculty affairs. I would also like to thank Lincoln Lauhon for his service as associate chair for the past 10 years. Their efforts have helped the department navigate challenging times and stay the course as a leading materials department both in research and education.

We are delighted to welcome two new faculty, Ian McCue and Ryan Truby, as assistant professors. Their profiles are provided in the articles that follow. Professor Robert Chang has retired after an illustrious career, marked by his leadership in the materials community, his development of innovative initiatives in education, and his successful community-building, including the establishment of the International Union of Materials Research Societies. Jiaxing Huang has assumed the position of Chair Professor of Materials at Westlake University in China. Although he continues his Northwestern affiliation as an adjunct professor, we will miss lively and creative discussions with him in Cook Hall.

The dedication and resilience of the MSE community in the face of the pandemic is inspiring. Our research continues to thrive with highlights that range from the use of artificial intelligence and machine learning to enable quicker and more efficient development of new materials, to the development of new materials with applications in healthcare, electronics, batteries, quantum computing, energy storage and environmental cleanup, and exciting milestones such as the demonstration of the first pacemaker made of fully bioresorbable materials.

Witnessing continued social injustices and global challenges over the past year prompted recommitment to making our materials community anti-biased and inclusive. We are investing in ensuring that scholars of all identities and backgrounds belong and thrive in our department and field, through concrete actions like forming a departmental Diversity, Equity, and Inclusion Committee and producing an accompanying Vision Statement; making evidence-based changes in our practices and policies, such as lifting our GRE requirement for PhD program applicants; and soliciting feedback via dialogue events and a department-wide climate survey.

Congratulations to all MSE faculty, students and alumni who have been recognized with recent awards and accolades. Many of these are listed in the links that follow. Please mark your calendars for May 19, 2022, when we will again celebrate achievements at our annual banquet. The event will include a much-delayed recognition of our 2020 Alumni Achievement Awardees Bryce Meredig and Mike Meshii. I hope you will consider joining us.

Peter W. Voorhees
Frank C. Engelhart Professor and Chair
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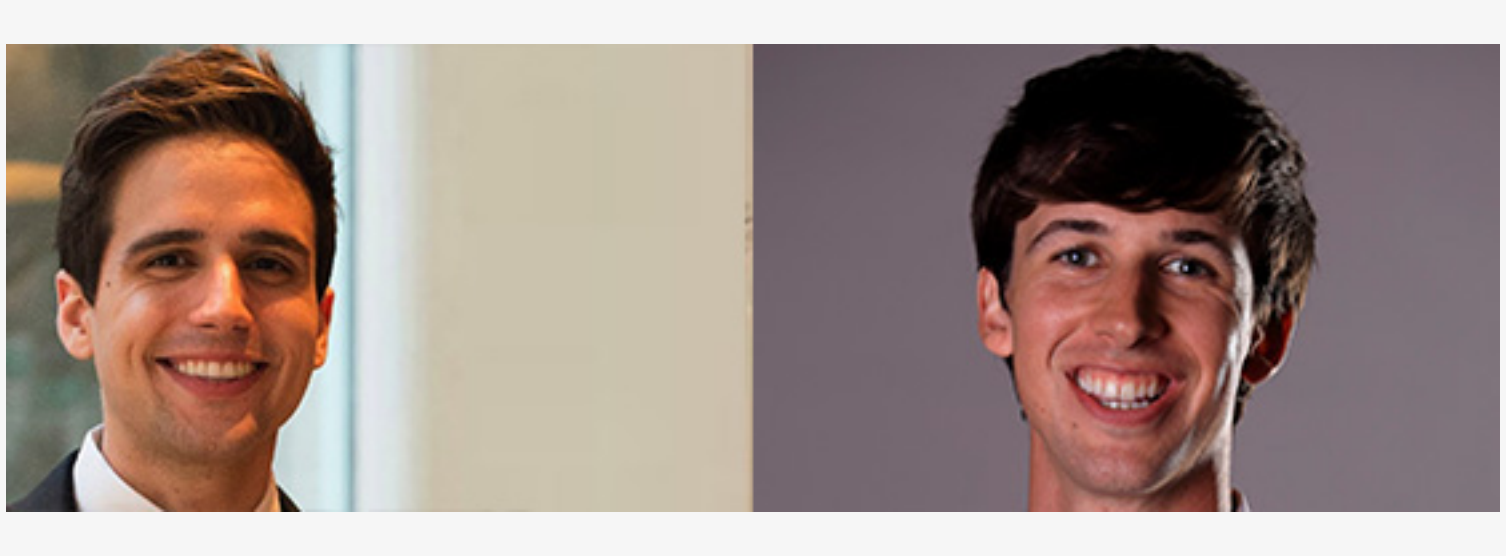
Northwestern Materials Science and Engineering Welcomes McCue and Truby

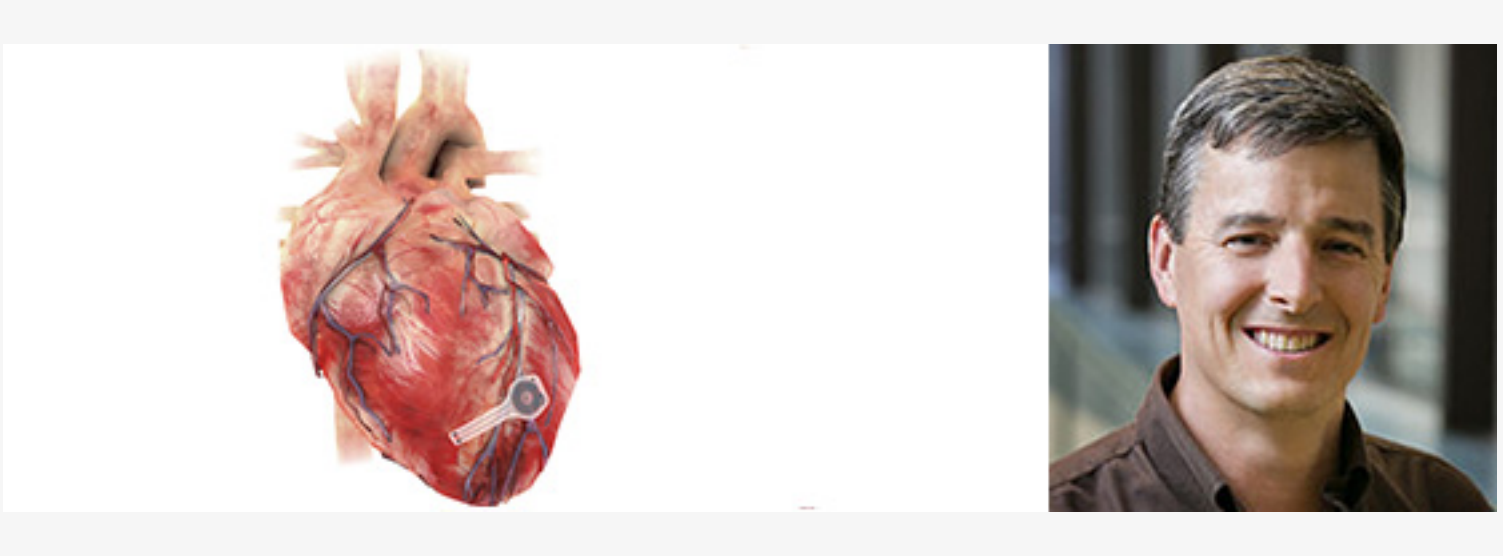


Northwestern Engineering's materials science department bolstered its list of professors by adding materials scientist **Ian McCue** and robotics expert **Ryan Truby** to its faculty.

Read more about Ian »

Read more about Ryan »

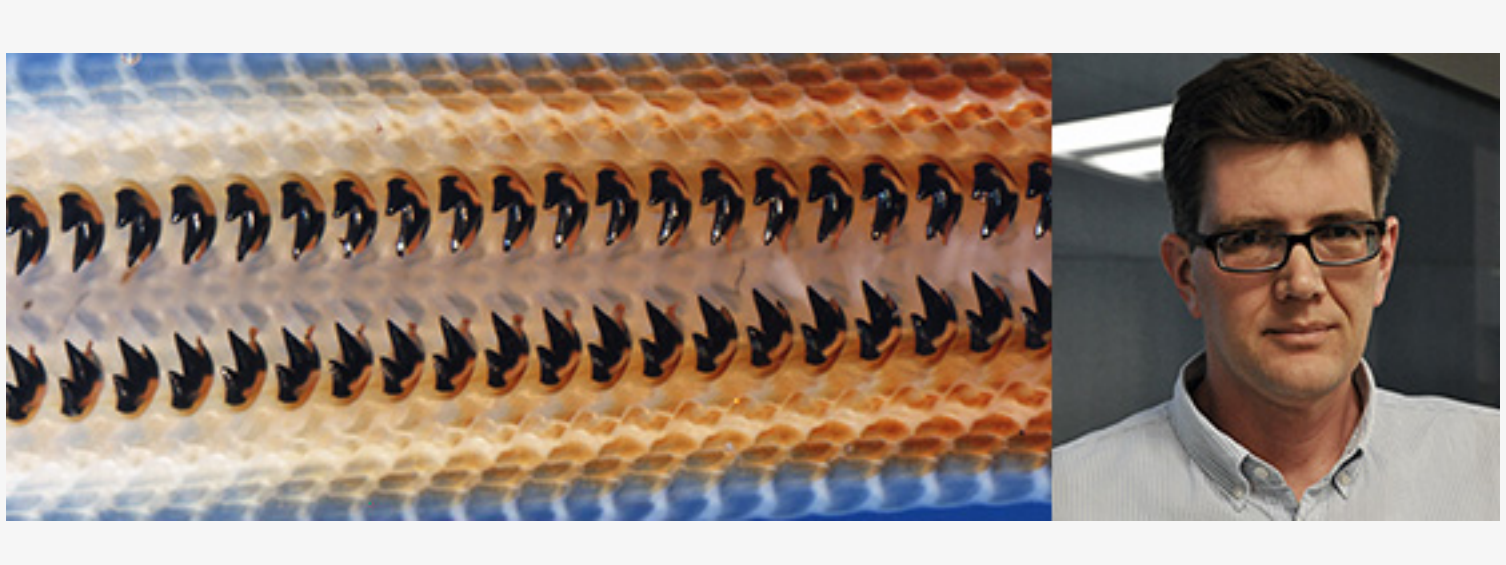
First-ever Transient Pacemaker Harmlessly Dissolves in Body



The thin, flexible, lightweight, wireless, fully implantable device developed by Professor **John Rogers** gives temporary pacing without requiring removal.

Read more »

Rare Mineral from Rocks Found in Mollusk Teeth



Professor **Derk Joester** and Northwestern Engineering researchers have, for the first time, discovered a rare mineral hidden inside the teeth of a chiton, a large mollusk found along rocky coastlines.

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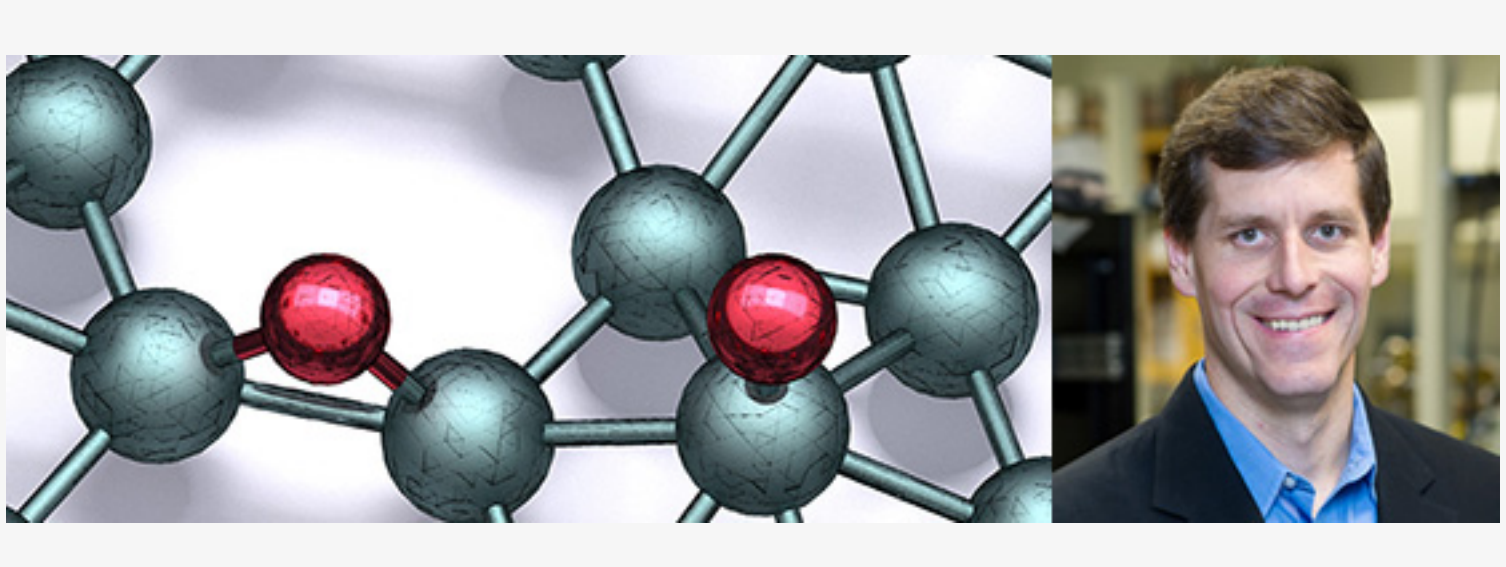
Scientists Stabilize Atomically Thin Boron for Practical Use



Created by Professor **Mark Hersam** and Northwestern Engineering researchers, Borophane is stable outside a vacuum, opening possibilities for real-world applications in electronics, batteries, and quantum computing.

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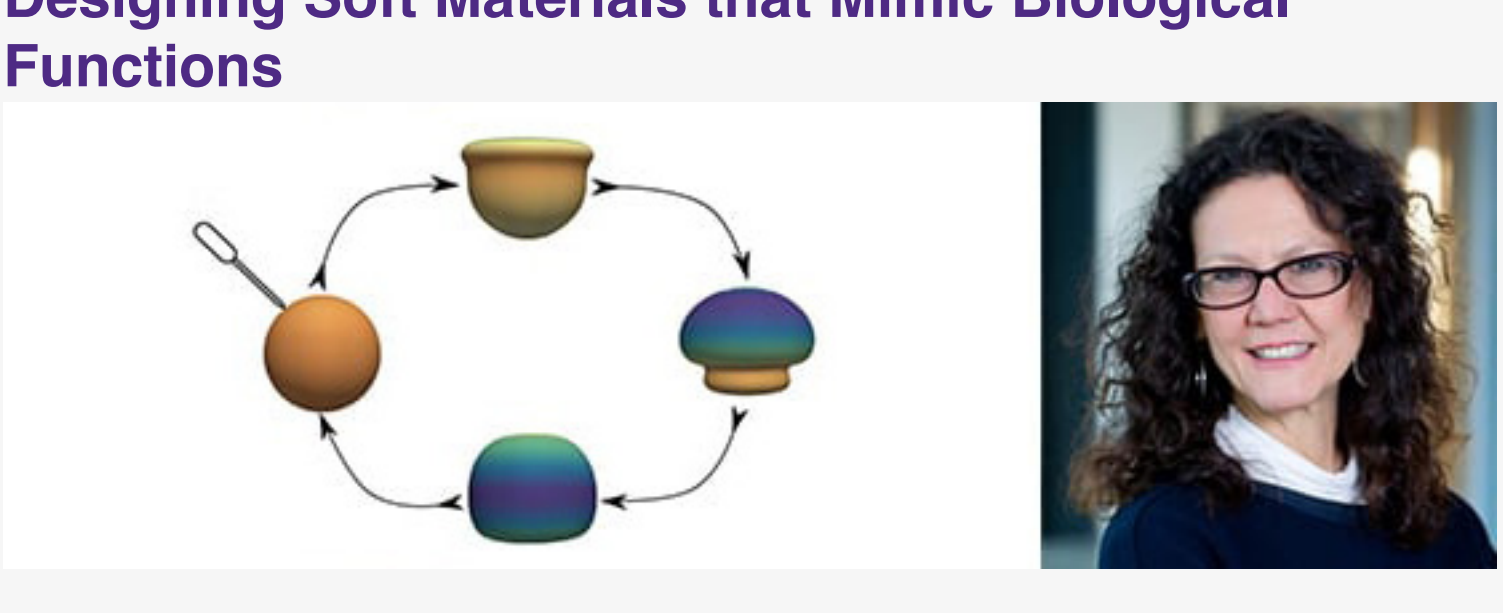
Designing Soft Materials that Mimic Biological Functions



A team of researchers led by Professor **Monica Olvera de la Cruz** developed a theoretical model to design a soft material that demonstrates autonomous oscillating properties that mimic biological functions, like heartbeat.

Read more »

Basic Science Leads to Sustainable Solutions

Fuel cell pioneer **Sossina Haile** focuses on social good on a global scale.

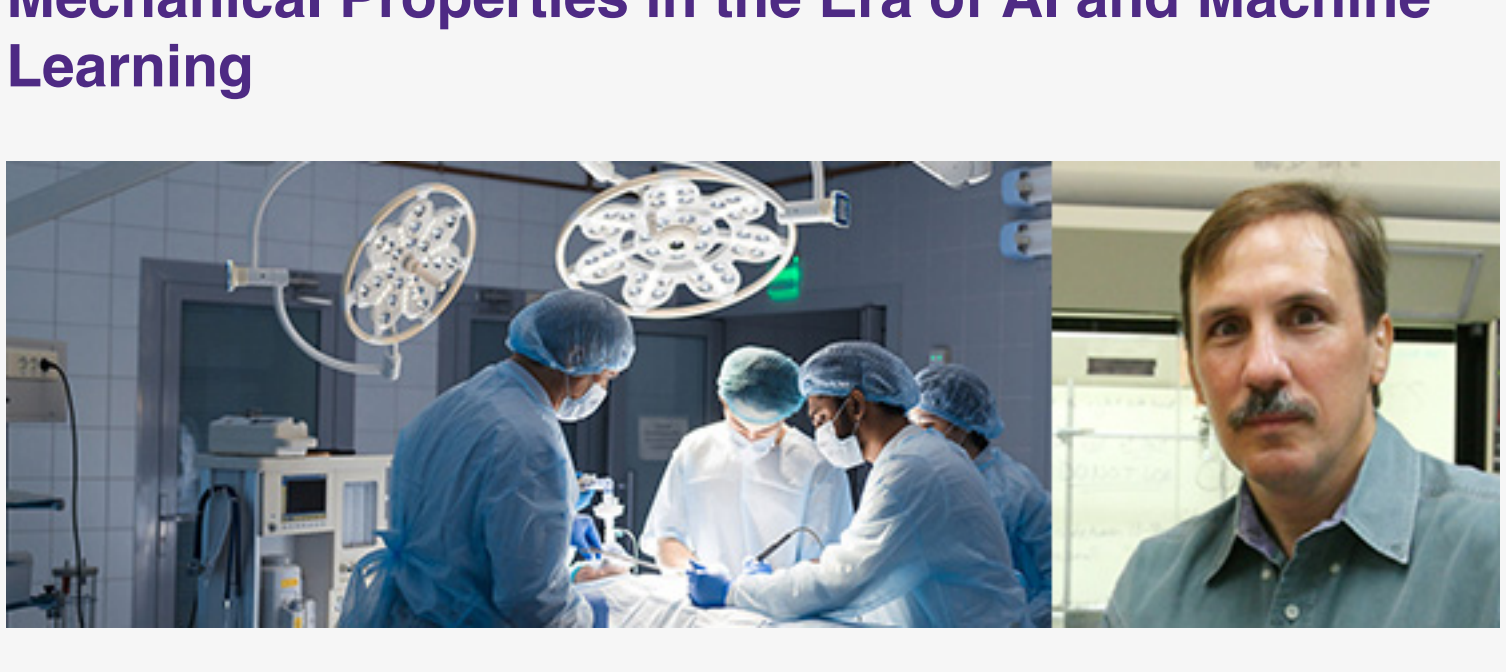
Read more »

New 'Swiss Army Knife' Cleans Up Water Pollution

First used to soak up oil in water, a new sponge developed by Professor **Vinayak Dravid** and Northwestern Engineering researchers sequesters excess phosphate from water.

Read more »

Novel Method Enables Enormous Datasets of Mechanical Properties in the Era of AI and Machine Learning



A group of researchers including Professor **Kenneth Shull** created a simple, inexpensive, and colorimetric characterization method for adhesive strength in soft materials that can run thousands of samples at the same time.

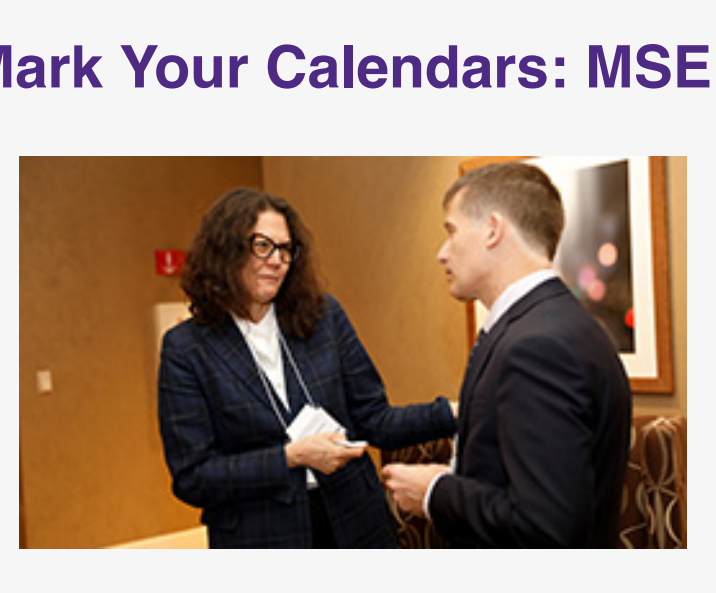
Read more »

Chang Looks Back on Career at Northwestern Engineering

Mentoring and guiding students brings pride to Professor Emeritus **Robert Chang**, who joined the Northwestern faculty in 1986.

Read more »

Mark Your Calendars: MSE Awards Banquet



On May 19, 2022, the department will hold its annual banquet. Among the festivities, the event will honor 2020 awardees Masahiro (Mike) Meshii (PhD '59) and Bryce Meredig (PhD '13).

FACULTY NEWS

Sossina Haile was **awarded the Ver Steeg Fellowship**.

Mark Hersam was one of two Northwestern faculty members to **receive the inaugural AAAFM-Stoddart Award** from the American Association for Advances in Functional Materials.

Derk Joester chaired the 38th Annual Hilliard Symposium on May 20. The keynote address "Chasing the Sun from Academia to Industry and Back Again" was presented by Arizona State professor Mariana Bertoni (PhD '07). Michael Rawlings (PhD '16) spearheaded a discussion on Diversity, Equity, and Inclusion, and Stephanie Hicks led an Implicit Bias workshop. Graduate student winners were:

- 1st place: Sonal Rangnekar (Hersam)
- 2nd place: Kristen Wek (Stupp)
- 3rd place: Kelly Parker (Dravid)

Other speakers included: Chase Brisbois (Olvera de la Cruz), Allessandra Dicorato (Joester), Ramya Gurunathan (Snyder), Chunyi Huang (Lauhon), Haiyue Huang (Huang), Liban Jibril (Dravid/Mirkin), James Male (Snyder), Luke Prestowitz (Huang), Travis Schmauss (Barnett), Donghoon Shin (Mirkin), and Raymond Wong (Rondinelli).

Erik Luijten and **Christopher Wolverton** were **included in a special thematic issue** of *Nature Materials*.

Chad Mirkin won the prestigious **Royal Society of Chemistry Prize**, and will **receive the 2022 Acta Biomaterialia Gold Medal** Award.

John Rogers was **named a Guggenheim Fellow**, and his wearable COVID-19 censor **received a major award from the US Department of Defense**.

Vinod Sangwan was chosen to receive the IEEE Chicago Distinguished Senior R&D Award.

Samuel Stupp will receive **the American Chemical Society 2022 Ralph F. Hirschmann Award in Peptide Chemistry**.

Christopher Wolverton's Open Quantum Materials Database (OQMD) **added its one millionth compound** to the platform.

ALUMNI NEWS

This spring, the Neutron Scattering Association announced the **Anne Mayes Neutron Scattering Prize**, to be awarded every four years to accomplished women in the field of neutron scattering. The award is in memory of Anne (1964-2011, PhD '91), an outstanding scientist, mentor, and faculty member at MIT.

Benjamin Goldberg ('81, MS '83), **Jeff Gotro** (PhD '83), and **Blythe Gore Clark** ('01) returned to campus for homecoming and presented career talks.

Deep Jariwala (PhD '15), assistant professor in the Department of Electrical and Systems Engineering at the University of Pennsylvania, and **Kelsey Stoerzinger** ('10), assistant professor at Oregon State University, were among **10 early-career faculty recognized** with Intel Rising Star faculty awards. Stoerzinger was also **awarded an Early Career Grant** in May.

Justin Scott (PhD '10), until recently head of research, engagement, data, and information at The Minerals, Metals & Materials Society, is transitioning to a new role as vice president of innovation and analytics at the Metals Service Center Institute.

Stuart Stock ('77, MS '78) was invited to give a plenary talk at the **August 2021 SPIE meeting on using computed tomography** to investigate the Hawara Portait Mummy.

Anil Virkar (PhD '73), Distinguished Professor of Materials Science and Engineering at the University of Utah and a member of the NU MSE Advisory Board, is one of three American Ceramics Society members **named as 2021 Distinguished Life Members**.

STUDENT NEWS

Michael Barsoum, **Patrick Ding**, and **Nicholas Pogharian** received Ryan Fellowships, supporting the exploration of fundamental nanoscale science.

Summer Undergraduate Research Award recipients included: **Conor Brew** (Dunand), **Jazmyn Lu** (Shull), **Dante-Marcil Montoto** (Snyder), **Alexia Popescu** (Haile).

Paul Brown was named the International Institute of Nanotechnology Outstanding Researcher and was awarded an NSF graduate research fellowship.

Raymonde Council and **Simona Fine** were among students awarded DAAD-RISE fellowships to study in Germany this summer.

Santiago Diaz Arauzo, **Alessandro Pereyra**, and **Michael Thuis** have been awarded GEM fellowships.

Caroline Harms was awarded the Meister Summer Undergraduate Research Grant to support her summer work with Professor Vinayak Dravid's group.

Zach Martin was awarded the Outstanding MSE Junior Award, recognizing his leadership as president of the MatSci Club and his research efforts with Professors John Rogers and Mark Hersam.

Alison Park and **Christian William** participated in the Summer Research Experience for Undergraduates at Cornell University.

Sam Pennell (Dunand) won third place in the ASM 2021 International Metallographic Contest (Class 4: Artistic Color) for his entry "Mind's Eye" from his NSF sponsored graduate research.

Naomi Pieczulewski (BS '21) was awarded the Hilliard Award for Leadership, Scholarship and Service, recognizing her role as co-founder and director of Maker-Girl at Northwestern, and her research on "Possibility of Interstitial Na as Electron Donor in Yb14MgSb11" with Professor G. Jeffrey Snyder.

Samuel Price received a Data Science fellowship.

Peiwen Ren (BA '21) was awarded the Hilliard Award for Research and Design for his undergraduate research on "Machine Learning Guided Discovery of Thermally-Driven Metal-Insulator Transition (MIT) Compounds," with Professor James Rondinelli.

David Venator was awarded a US DOE Science undergraduate research internship at Oak Ridge National Laboratory.

Lauren Walters (Rondinelli) was awarded the ASM Chicago Regional Scholarship.

FACTS & FIGURES

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

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