

Materials Science & Engineering (MSE)



Amit Misra

Department Chair and Edward DeMille Campbell Collegiate

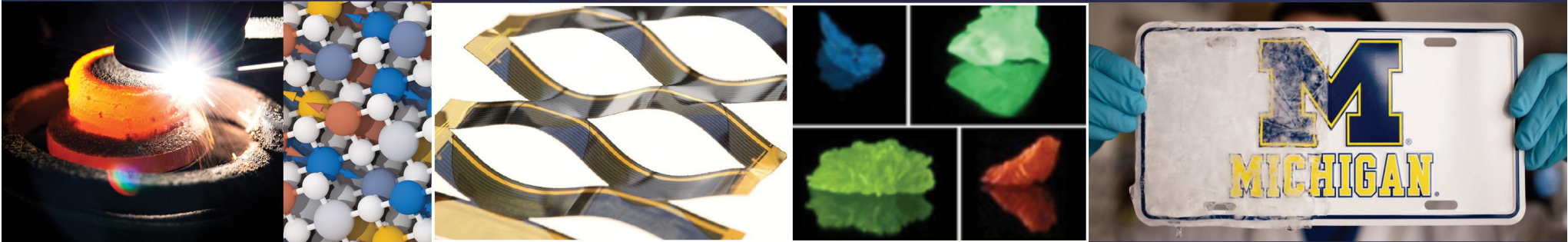
Professor of Materials Science & Engineering

Professor, Mechanical Engineering (by courtesy)

University of Michigan

Ann Arbor, Michigan

State-of-MSE-Department
September 23rd 2022
(homecoming)



www.mse.engin.umich.edu

Outline



MSE Strategic Plan

Faculty, Staff

Grad Program

Undergraduate Program

Research

Special Events

External Advisory Board (EAB)

MSE Mission/Vision Statements

KEY MISSION

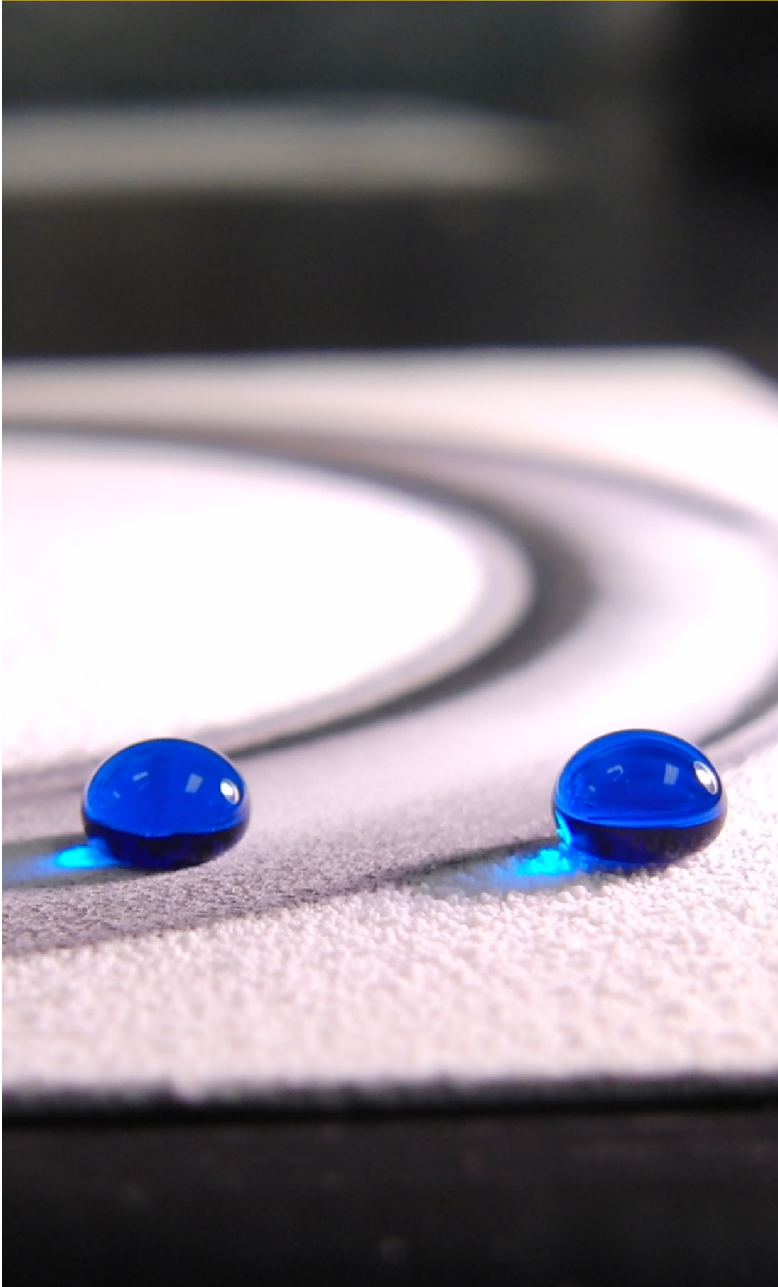
Educate and train a diverse workforce of materials scientists and engineers at undergraduate, graduate, and postdoctoral levels who will be the future leaders in industry, academia and national laboratories

VISION

A premier MSE department in the U.S. and beyond at both undergraduate and graduate levels



MSE Department Strategic Priorities



- “Critical mass” of world-class faculty in key topical areas
- Increase institutional support for state-of-the-art research infrastructure
- Increase externally sponsored research
- Enhanced, broader impacts and DEI initiatives

Materials are the building blocks for modern technologies and sustainability

Structural Materials

MECHANICAL PROPERTIES (Metals, composites)

- National infrastructure: (buildings, bridges)
- Automotive, Aerospace, Navy
- Defense
- Oil and gas
- Power generation
- Nuclear reactors
- Coatings



Lightweight structural materials
for transportation

Functional Materials

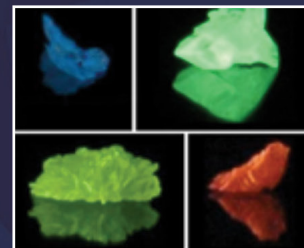
INORGANIC (Semiconductors, ceramics)

- Electronic, magnetic, optical (civilian & defense)
- Energy: Solar, Solid state lighting
- Thermoelectrics
- Batteries/energy storage



Kirigami-
inspired
solar cells

Organic
phosphors



ORGANIC “soft matter” (Polymers, biomaterials)

- Healthcare
- Consumer products

Icephobic coating



Bionic
heart
tissue



**MATERIALS SCIENCE
& ENGINEERING**
UNIVERSITY OF MICHIGAN

Expected world population: $\approx$ 9.6 billion by 2050



**“We do
not inherit
the Earth
from our
ancestors;
we borrow
it from our
children.”**

–American Indian

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New MSE Department Chair

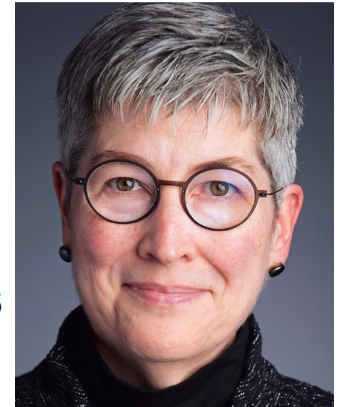
(January 1st 2023)



MSE is excited to announce that MSE alum [Professor Elizabeth Holm](#), Carnegie Mellon University, will become the next chair of the department, effective January 1.

Prior to joining CMU in 2012, Liz spent 20 years as a computational materials scientist at Sandia National Laboratories, Albuquerque, working on computer simulations of microstructure evolution, microcircuit aging and reliability, and the processing and welding of advanced materials.

She earned her dual Ph.D. (1992) in Materials Science and Engineering and Scientific Computing and her BSE (1987) in Materials Science and Engineering here at Michigan Engineering, and an S.M in Ceramics from MIT (1989).



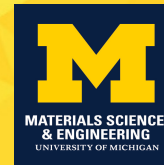
MSE bid adieu to Joanna Millunchick



On June 21, MSE faculty, staff and students gathered to wish Joanna Millunchick well before she left to become dean of the Luddy School of Informatics, Computing and Engineering at Indiana University in Bloomington. Farewell presentations included remarks by faculty emeritus Wayne Jones and a video of messages from several former students. "I take each of you with me in my heart," she told attendees.

MSE Tenured & Tenured-Track Faculty: 24

(Fall 2022)



Structural Materials



John Allison



Amit Misra



Alan Taub



Katsuyo Thornton (I)(C)



Emmanuelle Marquis



Liang Qi (C)



Ashwin Shahani

Functional Materials (Inorganic)



Rachel Goldman



Rick Laine



Steve Yalisove



Manos Kioupakis (C)



P. Ferdinand P. Poudeu



John Heron



Robert Hovden (O)



Yiyang Li



Weihao Sun (C)

Electronic/Energy Materials (Organic)



John Kieffer (C)



Jinsang Kim



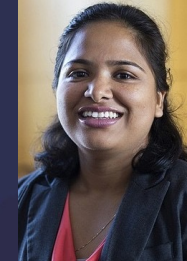
Brian Love



Max Shtein



Anish Tuteja



Geeta Mehta



Abdon Peña-Francesch



Claudia Loebel

(C) = Computational

(I) = Inorganic

(O) = Organic

Lecturers



Tim Chambers
Lecturer III



Kathy Sevener
Diversity, Equity & Inclusion
(DEI) Lecturer
Associate Research Scientist



George Wynarsky
Lecturer IV
(50%)

New Courtesy Appointment Faculty in MSE

Total = 23 (F'22)



ASHLEY BUCSEK ME
Assistant Professor



JERARD GORDON ME
Assistant Professor



XIWEN GONG ChE
Assistant Professor



Ageeth Bol
Professor of Chemistry

ME (8): Ashley Bucsek, Neil Dasgupta, Vikram, Gavini, Jerard Gordon, Wei Lu (ME), Pramod Reddy, Jeff Sakamoto, Michael Thouless
ChemE (4): Sharon Glotzer, Xiwen Gong, Joerg Lahann, Nick Kotov
NERS (4): Michael Atzmon (emeritus starting W23); Fei Gao; Gary Was (emeritus); Lumin Wang
ECE (3): Steve Forrest, Becky Peterson, Wei Lu(EE)
Aero (1): Henry Sodano; Civil (1): Victor Li
School of Dentistry (1): Peter Ma; Chemistry (1): Ageeth Bol.

Administrative/Technical Staff



Chris Cristian
Intermediate Desktop
Support Specialist



Sahar Farjami
Engineering
Technician



Shelley Fellers
Receptionist



Cassandra
Franklin-Smith
HR Generalist



Kristen Freshley
Comms/Marketing



Renee Hilgendorf
Graduate Program
Advisor



Amy Holihan
Finance and Research
Manager



Elen Hou
Research Administrator
Intermediate



Lourdes Jorgensen
Finance Specialist
(new hire)



Elen Kampf
Administrative
Assistant



Kathy Kuhn
Research
Administrator
Senior



Tina Longenberger
Executive Secretary



Keith McIntyre
Senior Facilities
Engineer



Ying Qi
Sr. Research Project
Engineer



Todd Richardson
Dept. Administrator



Justin Scanlon
Engineering Technician
(new hire)



Patti Vogel
Undergraduate
Program Advisor



Kevin Worth
Senior IT
Administrator

Faculty: Tenure & Promotion

(AY 21-22)



Heron and Shahani promoted to Associate Professor with tenure, effective Fall 2022

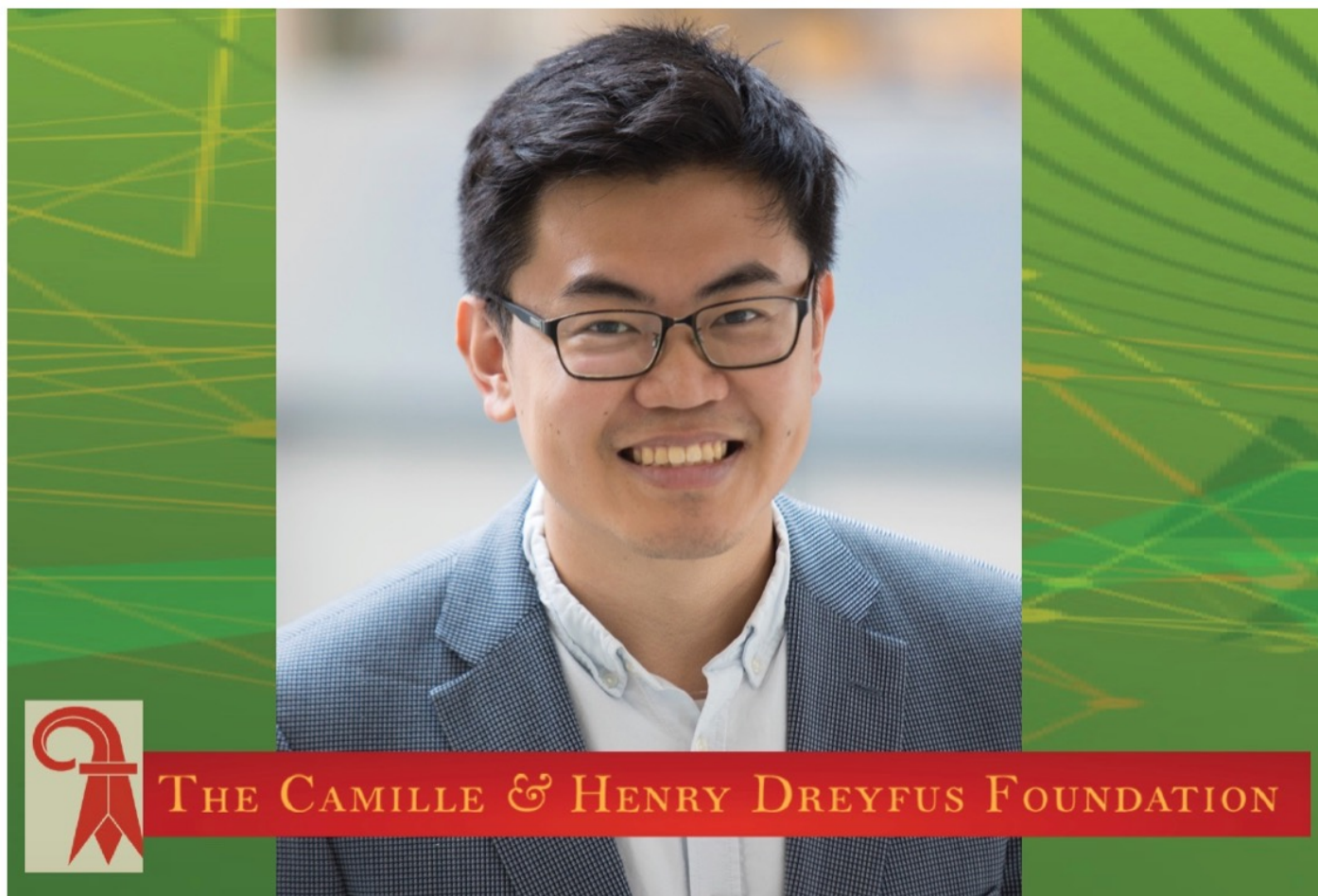


John Heron



Ashwin Shahani

Sun receives prestigious Dreyfus Award



Assistant Professor Wenhao Sun recently received a grant from the Camille and Henry Dreyfus Foundation for [Machine-Learning Classification of Materials Synthesizability](#). [Read more](#).

Assistant Professor Yiyang Li wins the Intel® Rising Star Faculty Award (RSA)



[Intel RSA](#) recognizes early-career academic researchers for leading groundbreaking technology research in computer science, electrical engineering, computer engineering, material science, and chemical engineering.

Yiyang Li is building a materials research program that can be fundamentally disruptive to semiconductors by incorporating electrochemical principles.

A grand challenge for brain-inspired neuromorphic computing that can improve AI energy efficiency is to develop an analog nonvolatile memory. Li is investigating how ions move to store information in memristors, a promising solution for analog memory. He was one of the inventors of the electrochemical random-access memory (ECRAM). Like a lithium-ion battery, ECRAM operates through ionic motion in solids. Li recognized that the state of charge of a battery is an analog value (100%, 99%, etc); ECRAM utilizes this intrinsically analog nature of ionic materials to store analog memory in a solid-state device.

Li has applied microelectronic principles to batteries. Device-to-device variability is an important metric in microelectronics. However, it has not been possible to directly quantify variability in batteries. Motivated by the need to measure “particle-to-particle variability,” Li is building novel instrumentation platforms able to study the electrochemical variability by cycling one battery particle at a time.



15 winners

- Carnegie Mellon University
- Cornell University
- Georgia Institute of Technology
- Indian Institute of Science, Bangalore
- Massachusetts Institute of Technology
- Purdue University
- Technion - Israel Institute of Technology
- Trinity College Dublin
- University of California, Berkeley
- University of California, Los Angeles
- University of California, San Diego
- University of Illinois Urbana–Champaign
- [University of Michigan](#)
- University of Pennsylvania
- University of Washington

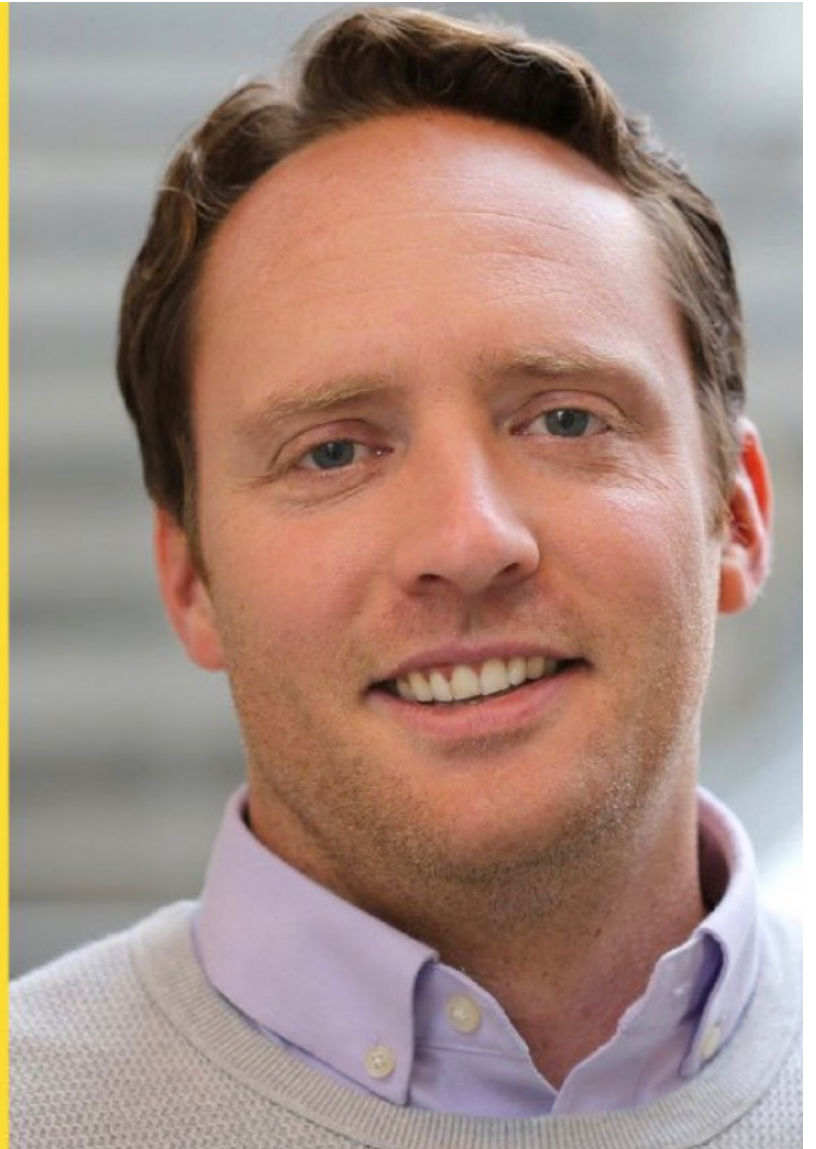
Shahani earns two professional society awards



2022 ASM
Bradley Stoughton
Award for Young
Teachers

TMS 2023
Frontiers of
Materials
Award

**2022
MSE Faculty
Outstanding
Accomplishment
Award**



PROFESSORSHIP RECOGNITION



**MATERIALS SCIENCE
& ENGINEERING**
UNIVERSITY OF MICHIGAN



MSE Department Chair **Amit Misra** was appointed Edward DeMille Campbell Collegiate Professor of Materials Science and Engineering during the AY19-20. The recognition ceremony, postponed due to the pandemic, will be hosted by College of Engineering Dean Alec Gallimore on **Friday, January 14** at 3:30 p.m. in the Johnson Rooms, LEC. As part of the proceedings, Professor Misra will present "Laser Processed Hierarchical Metallic Alloys." A reception will immediately follow in Masco Commons.

ENDOWED PROFESSORSHIP RECOGNITION



Please join us for **Alan Taub's
Robert H. Lurie Professor of
Engineering Lecture &
Ceremony**

**Tuesday, June 7
2:30 p.m.
220 Chrysler Center**

**Lecture title: "Contributions of a Materials Researcher Towards
Sustainable Mobility"**

Faculty Honors & Awards



MSE chair **Amit Misra** was elected Fellow of TMS. The award recognizes TMS members for outstanding contributions to the practice of metallurgy, materials science and technology. Misra was selected "for pioneering research in nanomechanics and interface-enabled mechanical behavior and radiation effects in multiphase and multilayered materials, professorship leadership, and mentoring of early-career scientists."

Tim Chambers



U-M led the nation with 20 faculty members elected as 2021 fellows of the American Association for the Advancement of Science...including our own **Rachel Goldman!**



Faculty emeritus **Wayne Jones** was honored with a symposium organized by the Light Metals Division: *Failure, and a Career that is Anything But: An LMD Symposium Honoring J. Wayne Jones*. The symposium was organized by MSE alums Tori Miller (Univ. of Florida), Nik Chawla (Purdue University), Trevor Harding (California Polytechnic State University), and Paul Krajewski (GM), and former faculty member Tresa Pollock (UC-Santa Barbara).

MSE department administrator Todd Richardson recognized with CoE MLK Spirit Award



The MLK Spirit Awards are given to students, student organizations, staff, and faculty in North Campus schools and colleges who exemplify the leadership and vision of Dr. Martin Luther King, Jr. through their commitment to social justice, diversity, equity, and inclusion.



Staff Awards



2021 Staff Service Award



*Keith McIntyre (Sr. facilities manager),
Sahar Farjami (Engineering technician)
Amy Holihan (Finance and research manager)
Not pictured: Cassandra Franklin-Smith (HR),
Ellen Kampf (administrative assistant) were
also recipients of the honor.*

CONGRATULATIONS to our 2021 CoE Staff Incentive Award winners!



Sr. facilities manager **Keith McIntyre** and undergraduate program advisor **Patti Vogel** were among the winners of the 2021 CoE Staff Incentive Award announced recently. Congratulations, Keith and Patti!

Outline



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MSE Graduate Program

- **Fall 2022 Enrollment:** 151 total (101 Ph.D. and 50 MS)
- **Diversity:** 33% female, 47% domestic, 9% URM
- **2022-23 U.S. News & World Report ranking:** #8
- **Research Expenditures:**
\$414K per T&TT and research faculty (2020 ASEE survey)



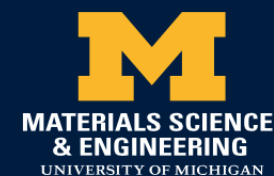
Manos Kioupakis
PhD/Graduate Chair



Renee Hilgendorf
Program Advisor



P. Ferdinand Poudeu
Master's Chair



New Ph.D. students, Fall 2022



Archi Agrawal



Tiernan Baucom



**Soumyadeep
Dasgupta**



Nicholas David



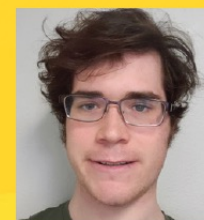
Daniel Delgado
(deferring until
winter term)



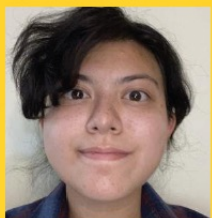
**Kelotchi Figueroa
Nieves**



**Jonathan
Goettsch (Jan. '22)**



Douglas Heine



Joy Hendrix



Chuqi Huang



Andrew Jalbert



Benjamin Justus



Devon Kleeblatt



Hailey Lovelace



Jason Manassa



Mahlet Molla



Ruth Oliver



Celeste Perez



**Jaimé Perez
Coronado (Jan. '23)**



Lingxia Shi



Dongiae Shin



Flora Tseng



Varun Venkatesh



Victor Vogt

Total: 24

|

Female: 10

|

URM: 4

|

International: 7

New MS students, Fall 2022



Yu-Shan Chen



Yuxuan
Deng



Vedant
Gaikwad



Yimo Hou



Jindong
Huang



Tzu-Yun Hung



Jonah
Jarczewski



Anto Jerish
Jeyadimal



Maheshwari
Kakade



Thomas
Korejsza



Zhan Liang



Yushen Liu



Emily
MacInnis



Jessica
McGahan



Caleb Phelan



Ziyuan Qin



Chaobo
Tong



Zenan
Zhang

SUGS



Ryan Gast



Kate Moo



Sahana Prabhu

Total: **25**

|

Female: **7**

|

URM: **0**

|

International: **16**

GSC Board 2022-23



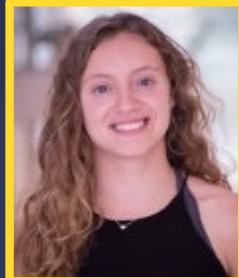
Loulou Batta
President



Forrest Wissuchek
Secretary



Hailey Lovelace
Treasurer



Julia Lenef
5th year rep



Catherine Haslam
3rd year rep



Avinava Roy
2nd year rep



Tathya Shinde
2nd year
Master's rep

Other Helping Hands



Tolu Lawal
GEO rep



Kyle Bushick
Past President



Paul Chao
Past Secretary



Hongling Lu
Past Treasurer

2022 Graduate Fellowships

J. Robert Beyster Computational Innovative Graduate Fellowship



Paul Chao (Shahani)

National Science Foundation



Kelotchi Figueroa
(Rackham Merit Fellowship)

Rackham Merit Fellowship



Mahlet Molla



Celeste Perez
(Rhines)

CoE and Department Fellowships



Archi Agrawal
(Pehlke, Rhines)



Tiernan Baucom
(Betz)



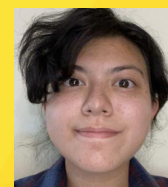
Soumyadeep
Dasgupta
(CoE Graduate
Fellowship)



Nicholas David
(CoE Graduate
Fellowship)



Douglas Heine
(CoE Endowed
Fellowship)



Joy Hendrix
(Rackham Block
Grant Fellowship)



Chuqi Huang
(Rackham Block
Grant Fellowship)



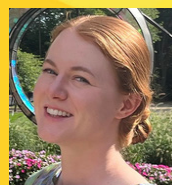
Andrew Jalbert
(Rackham Block
Grant Fellowship)



Benjamin Justus
(Rackham Block
Grant Fellowship)



Devon Kleeblatt
(CoE Endowed
Fellowship)



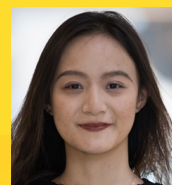
Hailey Lovelace
(Rackham Block
Grant Fellowship)



Jason Manassa
(Rackham Block
Grant Fellowship)



Ruth Oliver
(Ferrari)



Lingxia Shi
(Rackham Block
Grant Fellowship)



Dongiae Shin
(CoE Endowed
Fellowship)



Flora Tseng
(Rackham Block
Grant Fellowship)



Varun Venkatesh
(Rackham Block
Grant Fellowship)



Victor Vogt
(CoE Endowed
Fellowship)

MSE Graduate Fellowship Funds:

FREDERICK N. RHINES

Robert D and Julie A PEHLKE

Harry M. FERRARI

Karl Betz

Gerald I. and Joyce C. Madden

John Mardinly Fund ("Bequest")

Graduate Student Awards



(presented at the Graduation Dinner, April 2022)

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MSE UG Program

- Fall 2022 Enrollment: 95
- Diversity: 38% female, 96% domestic, 13% URM
- Degrees awarded in 2021-22: 42
- 2022-23 U.S. News & World Report ranking: #5



Katsuyo Thornton
UG Comm Chair



Steve Yalisove
Program Advisor,
ABET



Patti Vogel
Academic Advisor



Undergraduate Student Awards

April 2022

MMS Board 2022-23

(MSE Undergraduate Student Organization)



Mackenzie Darling
Vice-President Internal



Katie Wei
President



Jenny Chong
Vice-President External



Elliott Gorishek
Secretary



Kellie Chu
Treasurer



Denise Schlautman
Social Chair



Alexa Goldstein
Outreach Chair



Erdem Ozdemir
UG Committee Rep



Rachel Rajkumar
UG Committee Rep



MMS Advisor:
Tim Chambers

2022 UG Scholarships

Field (Nathaniel L.)

Aaron Cooke

Edward Spengler

Flinn (Richard A.)

Andrew Danbury

Fontana-Leslie (Mars-William)

Gabi Grey

Freeman (James W.)

Liam Cotter

Bao Vo

Heller (Jack J.)

Amanda Diddams

Hosford (William F.)

Leah Fleming

Megan Klein

Raj Koorapaty

Rishabh Kothari

Nina Perry

Denise Schlautman

Matthew Walker

Katie Wei

Schwartzwalder (Karl)

Erdem Ozdemir

Rachel Rajkumar

Siebert (Clarence A.)

Alexa Goldstein

Kevin Masel

Brianna Roest

White (Alfred H.)

Abigail Ahn

Zeyuan Hu

Reegan Ketzenberger

New:

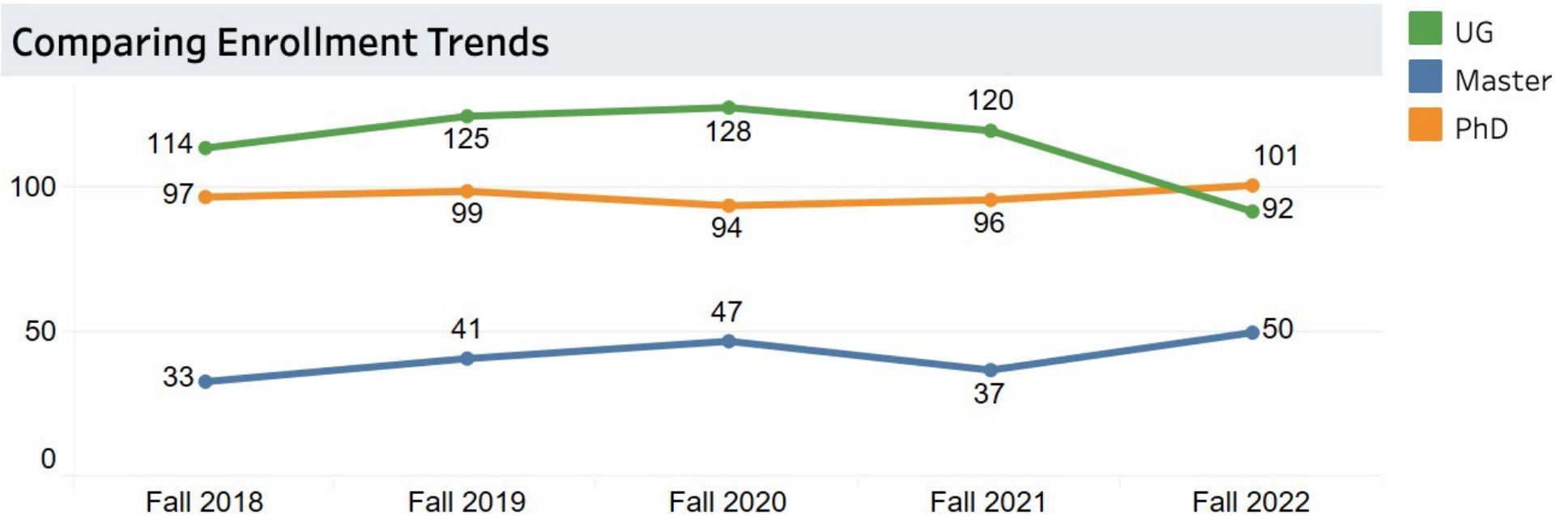
Wilbur C. Bigelow Scholarship Fund

5-year Enrollment Trends



- Fall 3rd week counts

Comparing Enrollment Trends

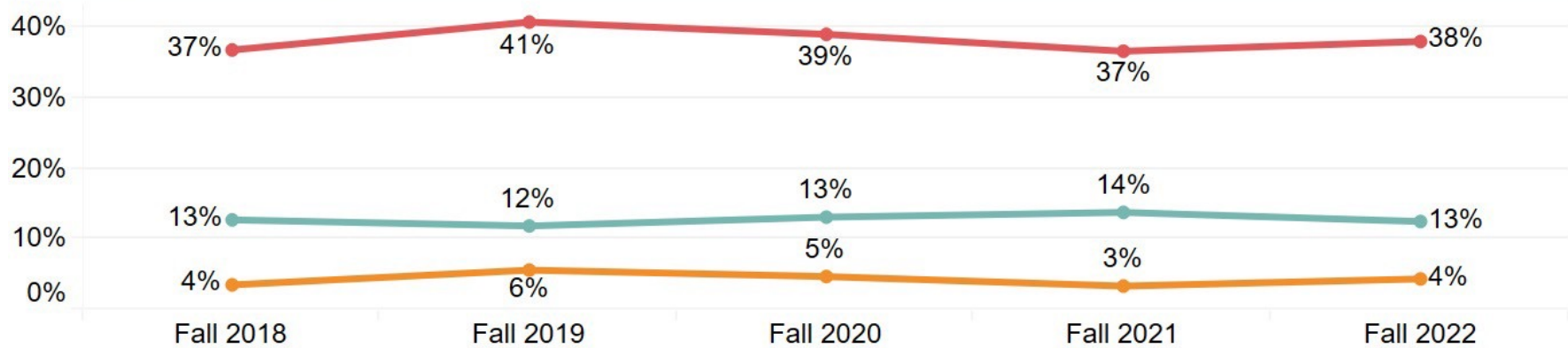


MSE Faculty also supervise PhD students from interdisciplinary PhD programs such as Macromolecular Science & Engineering, Applied Physics, and other departments (Chemical, ME, etc).

Diversity in MSE Degree Programs

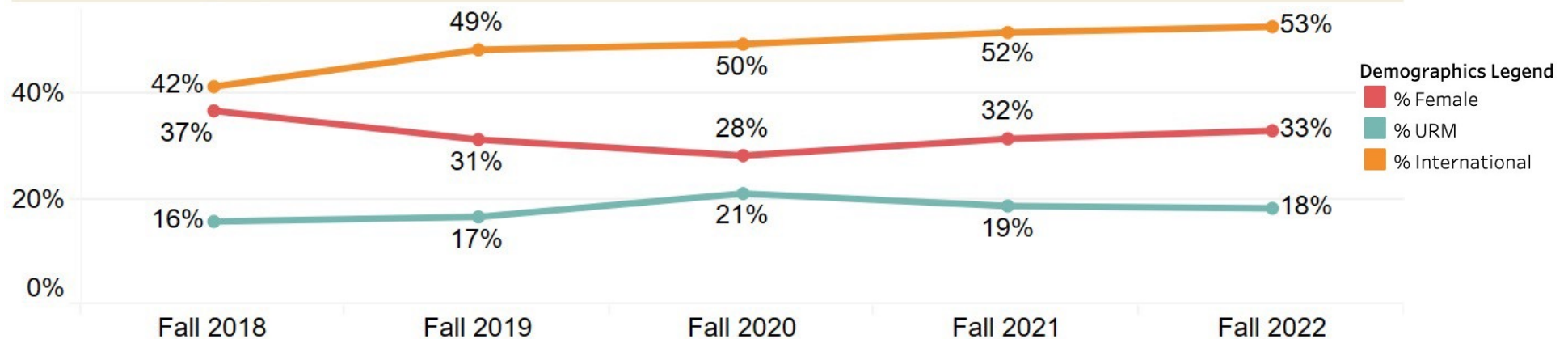


Undergrad Demographics



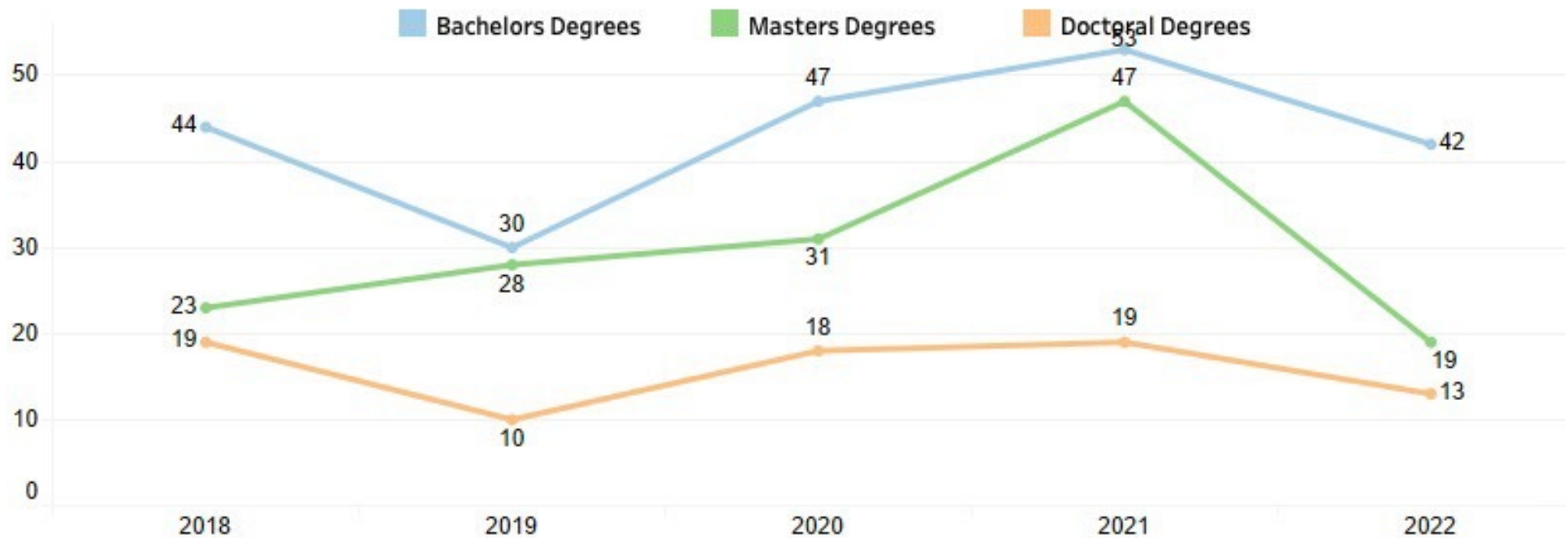
URM = Underrepresented Minorities, which include Black, Hispanic, Hawaiian, Native American or Two or More Races with at least one of the previous included. Percent based on ethnicity of domestic students only.

Grad Demographics



Demographics Legend
■ % Female
■ % URM
■ % International

MSE Degrees: 5-year Trend



CoE total degrees in 2022

BS = 2,309 (MSE is $\approx 1.8\%$)

MS= 1,143 (MSE is $\approx 1.7\%$)

PhD= 308 (MSE is $\approx 4.2\%$)

MSE $\approx 5.9\%$ T&TT CoE faculty

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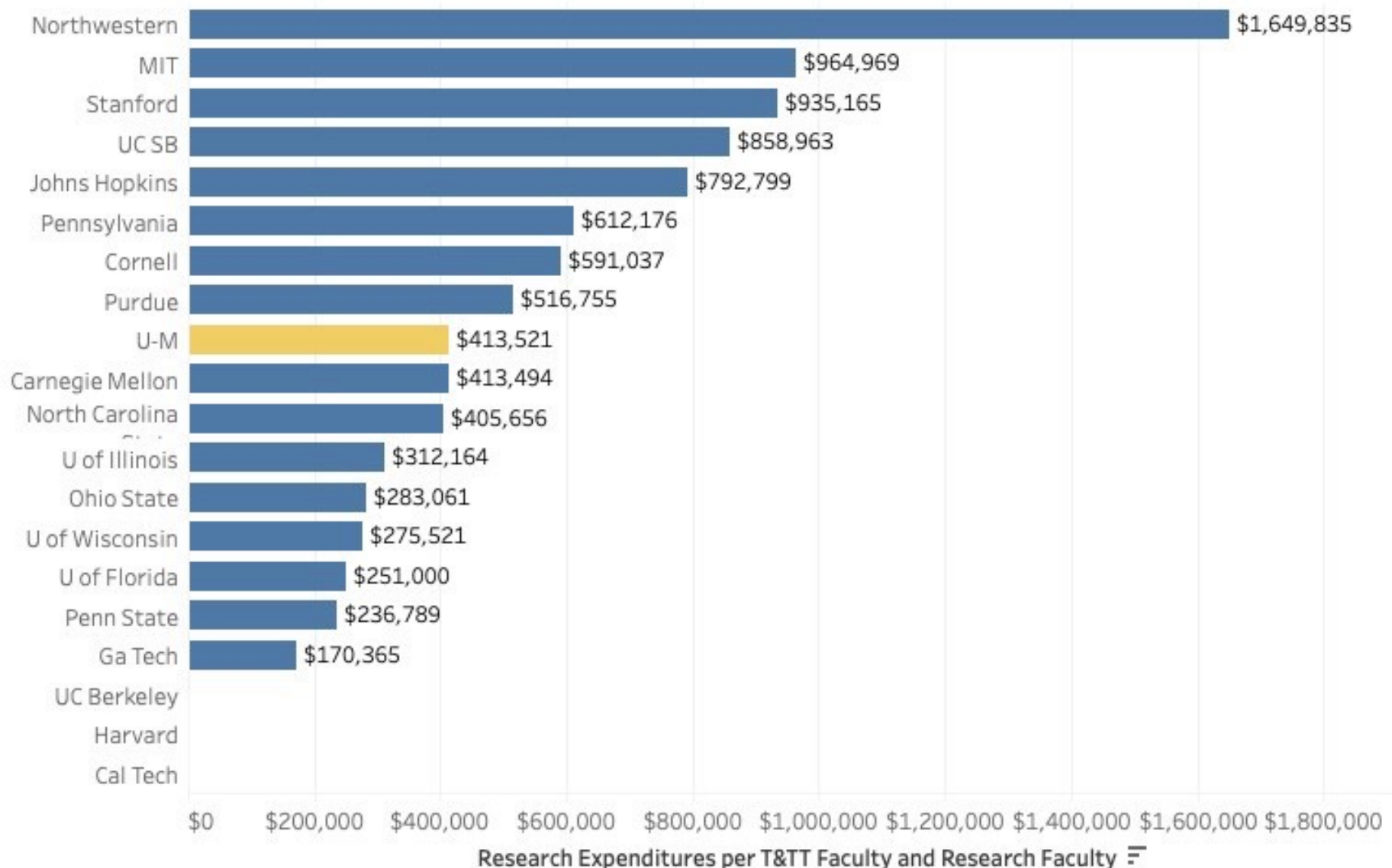
Special Events

External Advisory Board (EAB)

Externally Sponsored Research Expenditures

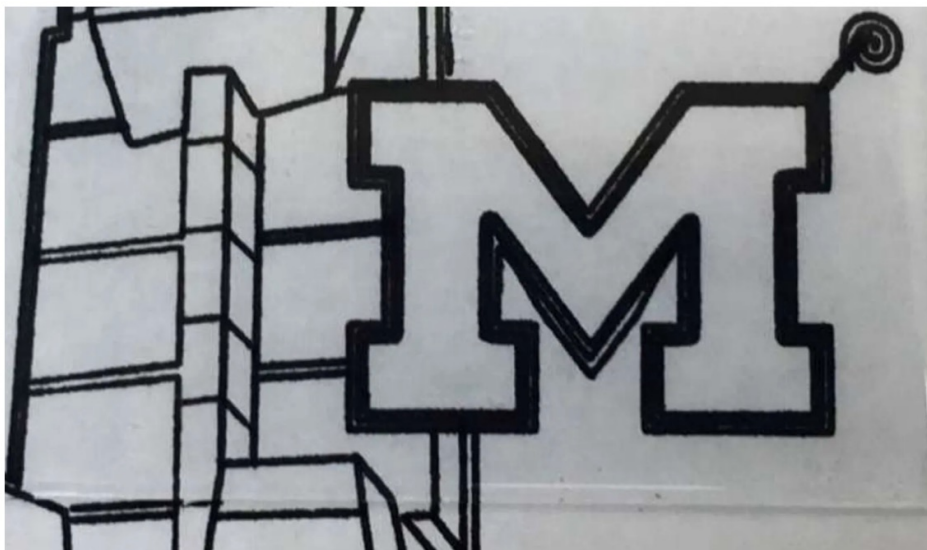


Research Expenditures per T&TT Faculty & Research Faculty



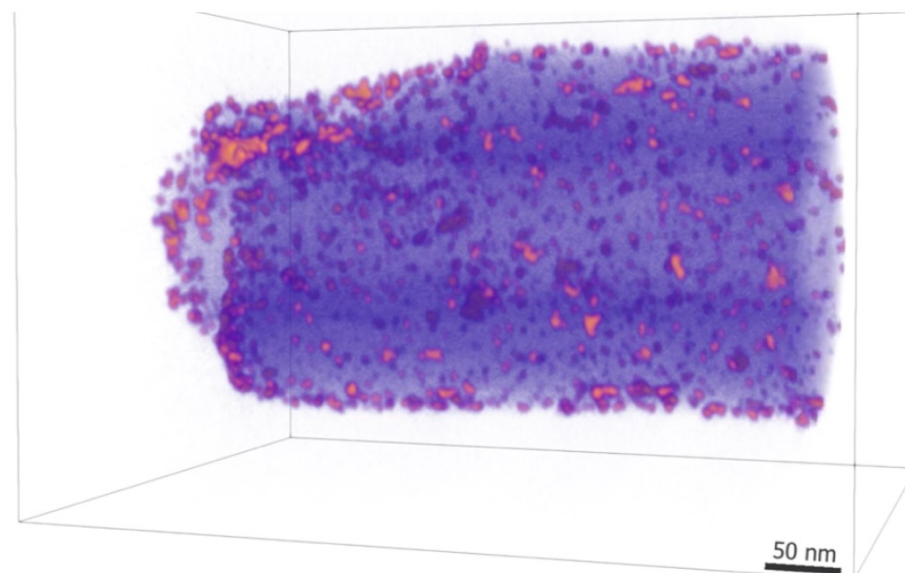
MSE Research Highlights

From the Tuteja/Mehta Labs:
New game-changing durable coating kills the COVID virus and other germs in minutes



A new tough, clear coating developed by a team led by **Anish Tuteja** and **Geeta Mehta** uses natural oils to kill viruses and bacteria. [Read more.](#)

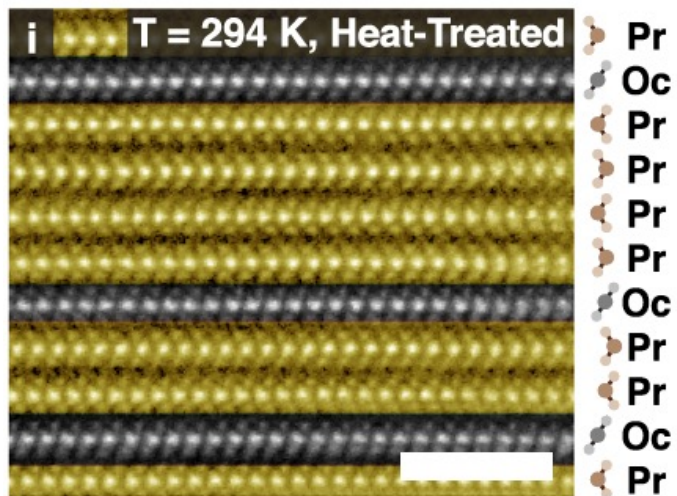
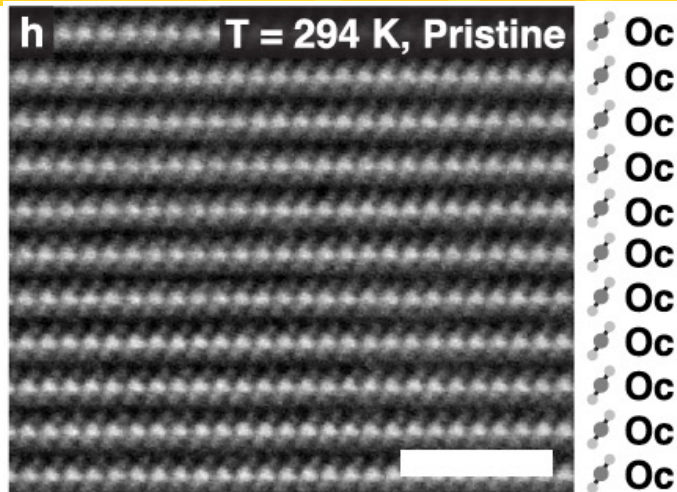
From the Hovden Lab:
Visualizing nanomaterial structures in real time



Thanks to a new beta version of tomviz, an open-source 3D data visualization tool, scientists now have an unprecedented level of access to the world of nanoscale materials. The software, developed by a U-M team led by **Robert Hovden** and assisted by **Nick Kotov**, connects directly to an electron microscope and enables researchers to see and manipulate 3D visualizations of nanomaterials in real time. [Read more.](#)

QUANTUM TECH: SEMICONDUCTOR "FLIPPED" TO INSULATOR ABOVE ROOM TEMPERATURE

(PI: Robert Hovden)

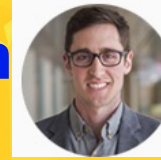


Atomic resolution cross-sectional HAADF-STEM of **h** pristine and **i** heat-treated $\text{Ta}_x\text{Se}_{2-x}$ confirms polytypic transformation. After treatment, prismatic (Pr) layers encapsulate monolayers of octahedral (Oc) layers. Scale bar is 2 nm. A selenium doped sample was imaged to enhance chalcogen visibility.

A semiconducting material that performed a quantum “flip” from a conductor to an insulator above room temperature was reported. It potentially brings the world closer to a new generation of quantum devices and ultra-efficient electronics.

Observed in two-dimensional layers of TaS_2 only a single atom thick, the exotic electronic structure that supported this quantum flip was previously only stable at ultra-cold temperatures of -100°F . The new material remains stable at up to 170°F .

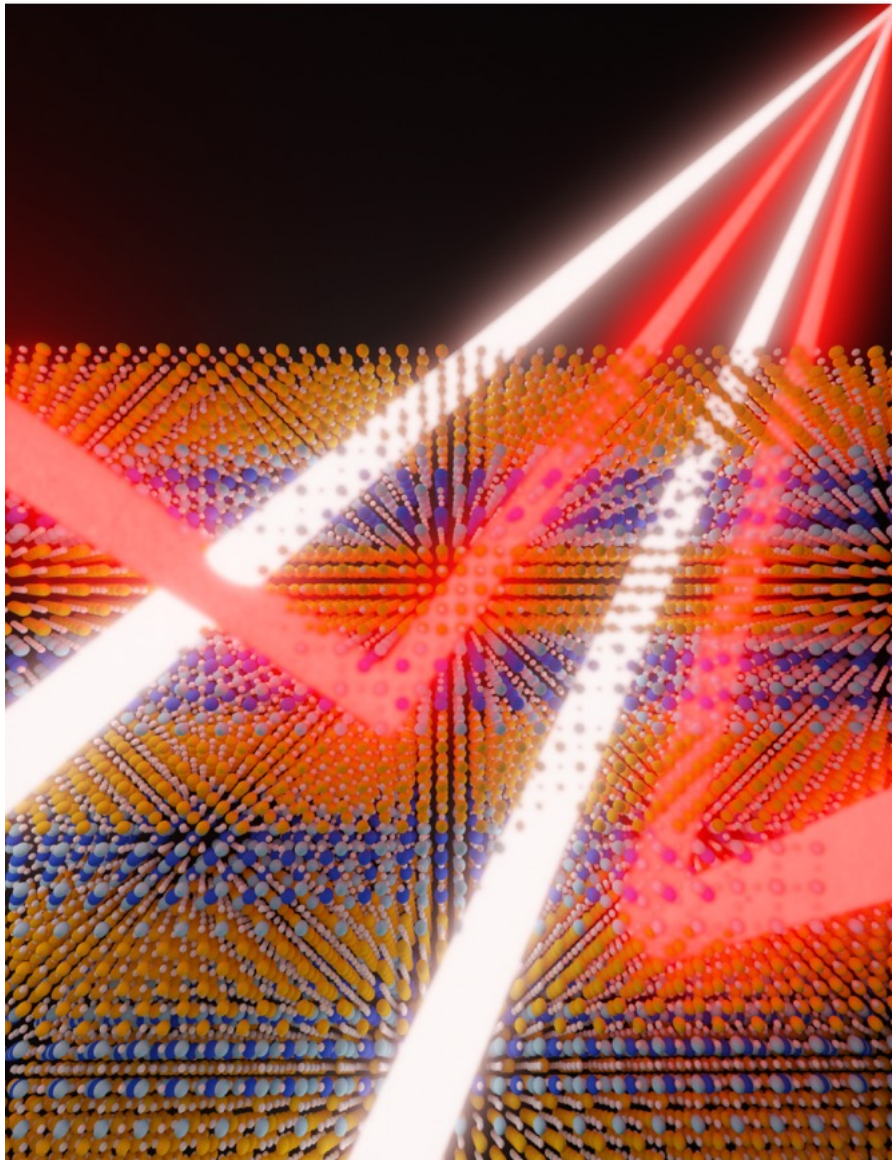
Nanophotonic control of thermal emission under extreme temperatures in air



Andrej Lenert
Chemical Eng.



John Heron
MSE

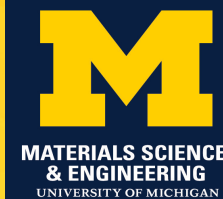


An epitaxial heterostructure designed of perovskite $\text{BaZr}_{0.5}\text{Hf}_{0.5}\text{O}_3$ (BZHO) and rock salt MgO is shown to be stable up to $1,100^\circ\text{C}$ in air.

The material uses destructive interference to reflect infrared energy while letting shorter wavelengths pass through. This could potentially reduce heat waste in thermophotovoltaic cells which convert heat into electricity. The material could also be useful in optical photovoltaics, thermal imaging, environmental barrier coatings, sensing, camouflage from infrared surveillance devices and other applications.

Department of Energy – Basic Energy Sciences (DOE-BES)

Energy Frontier Research Center



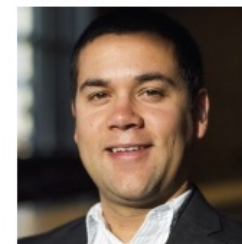
Mechano-Chemical Understanding of Solid Ion Conductors (MUSIC)

DoE - EFRC: \$10.95 Million, 4 years

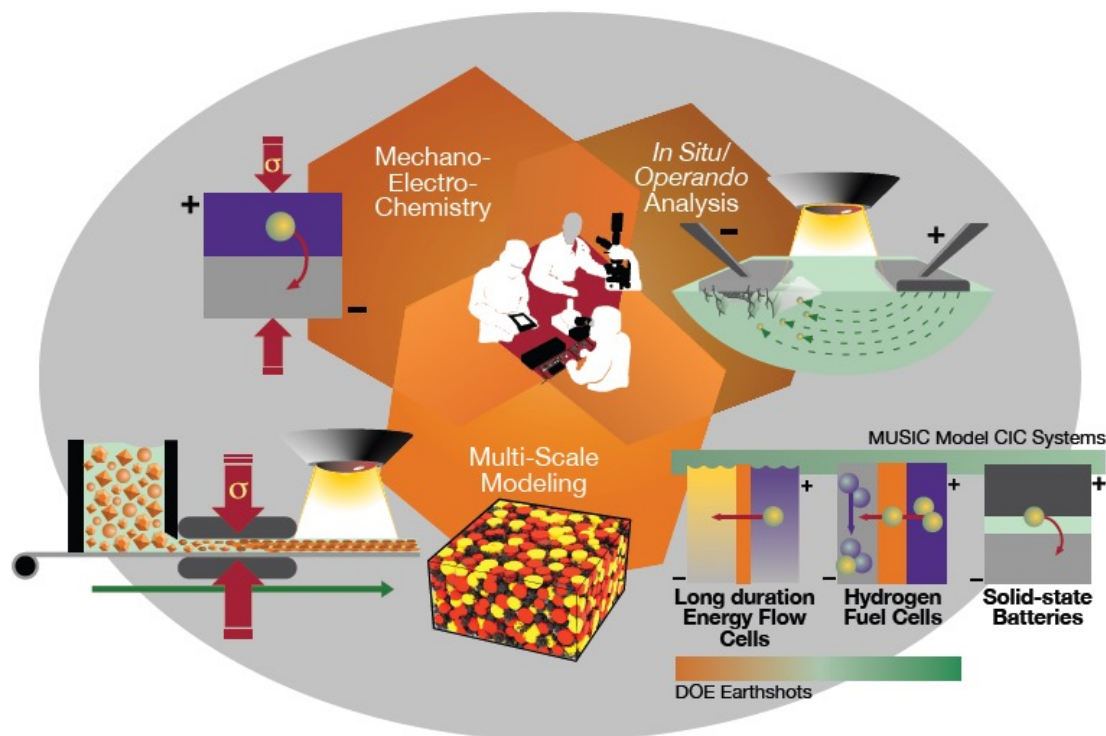
PIs: K. Thornton, M. Thouless, D. Kwabi, B. Bartlett



Jeff Sakamoto (*Director*)



Neil Dasgupta
(*Deputy Director*)



Partner Institutions:



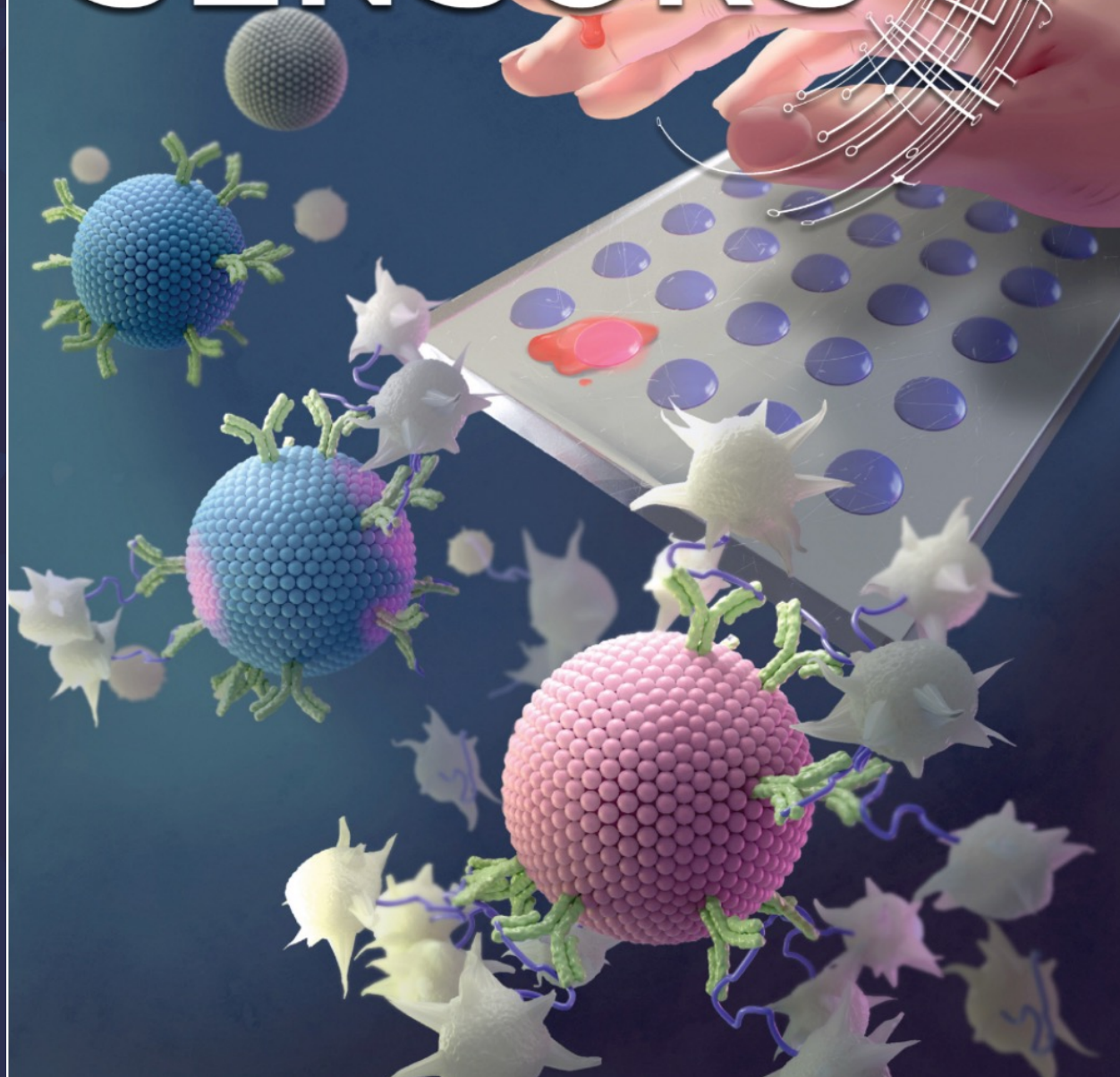
TEXAS
The University of Texas at Austin



Professor Jinsang Kim and team recently made the cover of the American Chemical Society's ACS Sensors for their manuscript "*Polydiacetylene Liposome Microarray toward Facile Measurement of Platelet Activation in Whole Blood.*"

SEPTEMBER 2021 VOLUME 6 NUMBER 9 pubs.acs.org/acssensors

ACS SENSORS



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Robert D. Pehlke Lectureship in Materials Processing, April 2022 (first in-person banquet after pandemic)



Don Sadoway, MIT

- Liquid metal battery for large-scale stationary storage
- Molten oxide electrolysis for carbon-free steelmaking.
- Founder of six companies: Ambri, Boston Metal, Avanti Battery, Pure Lithium, Lunar Resources, and Sadoway Labs.
- 100 Most Influential People in the World (Time Magazine 2012)



MSE Graduation Dinner

April 28th 2022

May 2022 Graduates: **37** undergraduates, **17** Master's graduates and **23** Ph.D. graduates



MSE Distinguished Alum Lecture 2022: Dave Martin

Happy to be Back on Campus In-Person



Graduation Dinner, Class of 2022



"Overcoming Climate Change: The Critical Role and Challenges of Energy Storage"



Please join us for this special lecture
with

Stanley Whittingham,
2019 Nobel laureate
in Chemistry

Monday, May 23 (2022)
4:30 p.m.
in Hill Auditorium

Learn more: <https://bit.ly/3vEXcyh>

Lawrence H. Van Vlack Distinguished Lectureship

MSE Open House

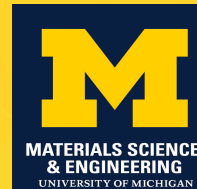


Madison Forstner takes her turn pouring liquified aluminum into a Block M mold during the MSE Undergraduate Open House on January 24. Photo by Steve Yalisove.

- 
- Graduate students Geordie Lindemann (left) and Paul Chao (center), along with Professor John Heron field questions about MSE during the Majors Fair

Macromolecular Science & Engineering Graduate Program
&

Department of Materials Science & Engineering



We are all in this together

DEI/Mental Health Workshop

June 17th 2022, 9am – 5pm + social afterhours

Organized by: Prof. Claudia Loebel, Prof. Abdon Pena-Francesch

Keynote: Becoming a Resilient Scientist

Dr. Sharon Milgram

Director of the Office of Intramural Training
And Education – NIH

Break & snacks

MACRO Faculty Panel (open)

Discussion III: faculty experiences

Workshop: reflection, challenges & opportunities



MMS Halloween Celebration 2021



MSE students Marisa Perez, Yumeng Bai, and Kate Moo pose with their creations at MMS' pumpkin-carving event last Thursday night in Mason Hall.

MSE Annual Holiday Party December 2021

Organized by GSC and MMS



Justin Marshall (3rd place), Aaron Gladstein (2nd place), Duncan Greeley (1st place)

MSE Hosts ASM Materials Camp



Discover the Many Possibilities in Engineering

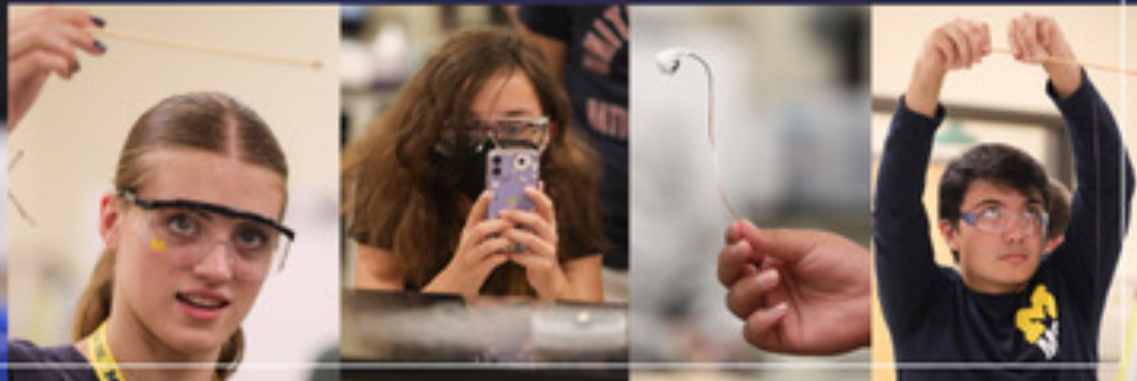


Designed for 8th – 10th-grade kids who want to thoroughly explore various engineering disciplines



Discover Engineering 2022

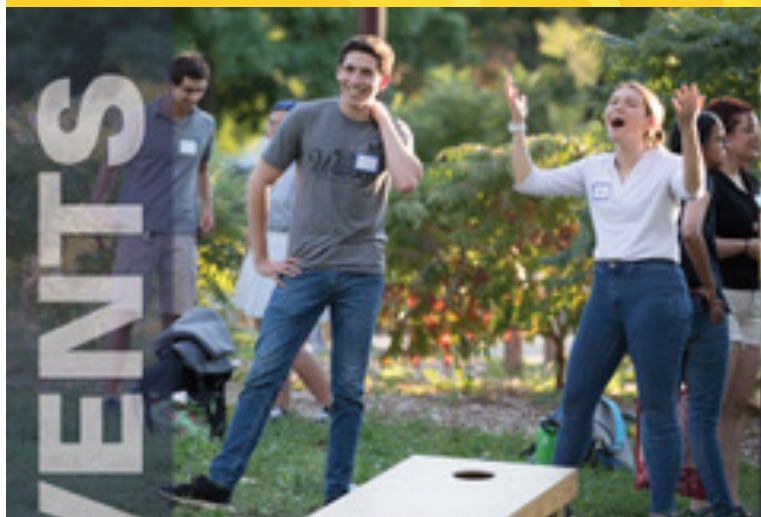
July 28-29



MSE Fall 2022 Picnic



MSE EVENTS



Welcome Back Picnic



MSE Bladesmithing becomes a UM-level Student Organization



The MSE Bladesmithing team has grown and upgraded to become a university-level student organization! They are now an official Sponsored Student Organization (SSO) registered as The Michigan Blacksmithing Club. Congratulations to the team on this new status and to MSE rising senior **Megan Klein**, who is the incoming club president.

Joyworks hosts the Annual Pizza and Pour



Students display their U-M manganese bronze seals during MMS's Pizza and Pour event at Joyworks Friday evening. Thanks to Chip Keough for hosting!



Kyle Bushick (Kioupakis group) answers prospective students' questions during the research poster session.



Prospective students, faculty and MSE graduate volunteers at Pizza House Friday evening.



Robert Hovden, Amit Misra and John Heron with Ira Hovden (age 3) at Pizza House (because it's never too early to start recruiting students...:-)

Graduate Recruiting Visit back in-person for first time since 2019.

MSE welcomed 29 prospective Ph.D. students to campus last Friday, March 11, after a two-year, pandemic-induced hiatus.

"We had a really great visit," commented MSE graduate program advisor Renee Hilgendorf. "Everyone was so happy to be here and eager to talk to our faculty and students about our program."

The prospective students hailed from 24 colleges across the U.S. and Puerto Rico.

Materials Tour at UMMA

University of Michigan, Museum of Arts



Conch Trumpet: Acoustic
Properties of Materials

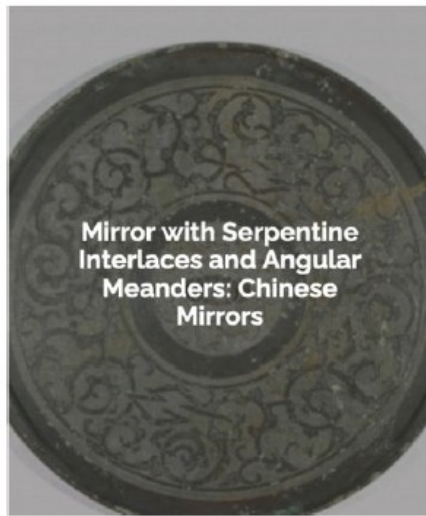


Shakudô Tsuba: Metallic
Surface Coloring



Hammered Basin:
Defense Against
Pathogens

umma



Mirror with Serpentine
Interlaces and Angular
Meanders: Chinese
Mirrors



Goryeo Celadon Gourd
Shaped Ewer with Lid:
Glaze Color



Donald Maxwell Robiner
Inkwell Collection:
Appearances of Glass

A GSC outreach team led by Brian Lezzi and Paul Chao researched and created a self-guided materials tour that explains the science behind select art objects.

**UM-OSU Alumni & Friends Mixer
TMS Annual Meeting,
Anaheim, CA, March '22**



2022 Calendar art images



Front cover: "Psychedelic"

by Lauren Duke '22

Optical Microscopy image of liquid crystal channels along in a TI-20 calculator display

"Snow Globes"

by Alex Halvey
(Tuteja)



Water droplets resting on a superhydrophobic surface made from fluorinated polyurethane, silica, and fluorodecyl polyhedral oligomeric silsesquioxane

"Snowflakes"

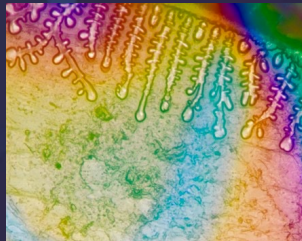
by Aaron Gladstein
(Taub)



Al₃Ti intermetallics and TiC particles in an aluminum matrix! SEM images of an Al-TiC metal matrix composite were colorized

"Frozen Rainbow"

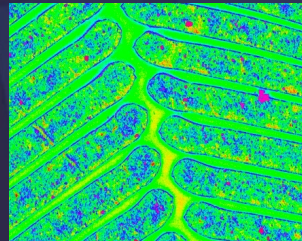
by Lauren Duke '22



Optical Microscopy image of liquid crystals along a fracture point in a four function calculator display.

"Silicon Rib Cage"

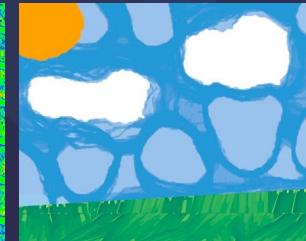
by Babhu Sahu (Misra)



Silicon flakes with patterned ribs.

"Field of Eutectic"

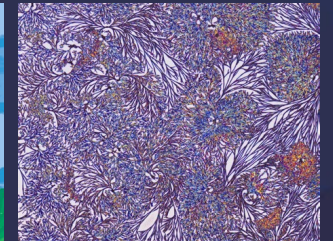
by Geordie Lindemann (Shahani)



A blue sky of Ag₂Al and Al₂Cu, peppered with clouds of Al, overlooks a pasture of green Ag₂Al eutectic rods.

"Microscopic Fireworks"

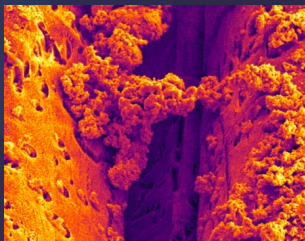
by Taylor Repetto (Mehta/Tuteja)



Carbamazepine printed on fluorinated silane.

"Bridge Over Troubled Water"

by Amy Langhast (Taub)



Strengthening iron oxide nanoparticle bridge between individual flax fiber plant cells.

"Patchwork Quilt"

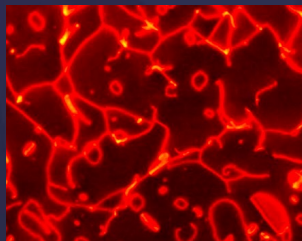
by Paul Chao (Shahani)



Cross-sectional projection view from a subvolume containing ultrafine Al-Si eutectic colonies.

"Rings of Fire"

by Anshul Kamboj (Marquis)



TEM image from an irradiated NiCr alloy showing perfect and frank loops in the image plane (represented by circles and ellipses) and in the plane perpendicular to the image plane (represented by lines).

"Something is out there"

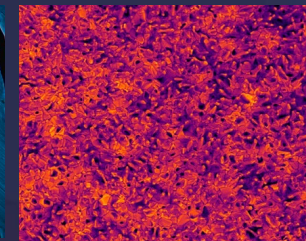
by Fan-Wei Wang (Tuteja)



Metallic foam structure (Copper).

"Fire Coral"

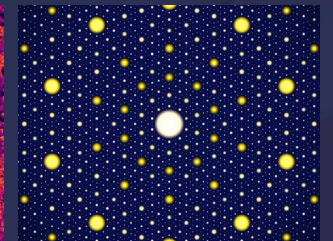
by Thomas Valenza (Marquis)



Top surface of pure Ti oxidized in air, showing textured, spiky TiO₂ reminiscent of coral.

"Constellation X"

by Xander Mensah '23 (Thomton)



Artistic fractal interpretation of a decagonal-quasicrystal electron diffraction pattern along the 10-fold axis.

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MSE External Advisory Board 2022

<http://www.mse.engin.umich.edu/alumni/external-advisory-board>



Keith Bowman



Aaron Crumm



Jeff Carbeck



Dave Mortensen



Ray Decker



Dan Gamota



Irene Peterson



Jody N. Hall



Jason Hertzberg
(Chair)



Jerry Hoffman



John (Chip) Keough



Mark Nichols



Ron Radzilowski



Neil Weissman



Jim Yurko



Liz Holm

New Department Chair
January 1st 2023

MSE Alumni Awards

DISTINGUISHED ALUMNI LECTURE

Dave Martin (2022)

*

Mark Nichols (2019)

Greg Hilmas (2019-Fall)

Nik Chawla (2018-Fall)

Keith Bowman (2018)

Dawn Bonnell (2017)

Liz Holm (2016)

*(Fall 2020/S2021: no lecturer awarded due to COVID)



CoE Alumni Merit Award

Rita Baranwal (2022)

Michelle Griffith (2020): presented Fall 21

Jim Yurko (2019)

Max Madden (2018)

Kim O. Flesner (2017)

Aaron Crumm (2016)

Don Nolan (2015)

Paul Krajewski (2014)

Dave Martin (2013)

Jason Hertzberg (2012)

Dawn Bonnell (2011)

Jim Speck (2010)

Leonard G. Miller (2009)

Kevin Chang (2008)

Jody Hall (2007)

Won Suk Cho (2006)

Bob Pehlke (2005)

Chip Keough (2004)

Wally Rhines (2003)

Thomas Brady (2002)

Chris Dingell (2001)

Ann Rowe (2000)

Ernest Kirkendall (1999)

Vincent Gorguze (1998)

Dean Hanink (1997)

T. Sharp (1996)

Jere Brophy (1995)

Ray Decker (1994)

Arden Bement (1993)

Don Frey (1992)

MSE Alum Elected NAE Member



Dr. Jim Yurko (BSE '97), Senior Distinguished Engineer with Apple, has been elected to the National Academy of Engineering, the nation's most prestigious engineering association. Yurko is one of 111 U.S. members inducted this year. Fellow 2022 inductees include SpaceX CEO Elon Musk and Microsoft CEO Satya Nadella.

MSE Alumni Recognized at TMS Annual Meeting



Clinique Brundidge, Lead Materials Scientist with the Naval Surface Warfare Center, received the **TMS Stuctural Materials Division Young Leaders Professional Development Award**.



Elizabeth A. Holm, CMU

TMS Stuctural Materials Division Distinguished Scientist/Engineer Award as well as the **AIME Honorary Membership Award**.

Victoria Miller, an assistant professor at the University of Florida, received the **Young Leaders International Scholar - JIM**.



MSE alum and EAB member Jim Yurko, NAE, Senior Distinguished Engineer at Apple, presented the Plenary talk: "Alloy Design at Apple."



Corbett Battaile, Principal Member of Technical Staff at Sandia National Laboratories, earned the **TMS Materials Processing & Manufacturing Division Distinguished Service Award**.

Paul Krajewski, MSE Alum, NAE, General Motors, headlined the EPD/MPMD's luncheon with "An Automotive View of Sustainability."

Thank you to all alumni for their gifts and donations.

Full list is published in the annual MSE newsletter.