



TEAM **M** MSE

This Thanksgiving stay safe...and thankful

Covid is the gift that keeps on giving; this week, most likely, it's impacted your traditional Thanksgiving plans. We know it's not easy, but we hope over this Thanksgiving holiday you are still able to find things in your life you are thankful for...even if you have to dig a little. To get the holiday cheer rolling, in this issue we have some upcoming events to keep you busy and some internship opportunities (one from Apple!) to consider. We are also *extremely* excited to announce our 2021 calendar art image winners and can't wait for you to see how they've creatively transformed scientific images into works of art. And, toward the end of the issue, we have a special Thanksgiving bonus: a list of what some MSE faculty and staff are thankful for this season.

This issue may be our longest one yet - so, ready, set, scroll...

Questions, comments or ideas for TeamMSE? Contact Kristen at krisfres@umich.edu.

We'd love to hear from you!



Campus COVID Status

Before you go...

If you are leaving campus this week, the university is strongly encouraging [departure testing](#). Undergraduate students living in Michigan Housing are expected to get tested prior to departure. All graduate students and undergraduate students living off campus are strongly encouraged to be tested before departing.

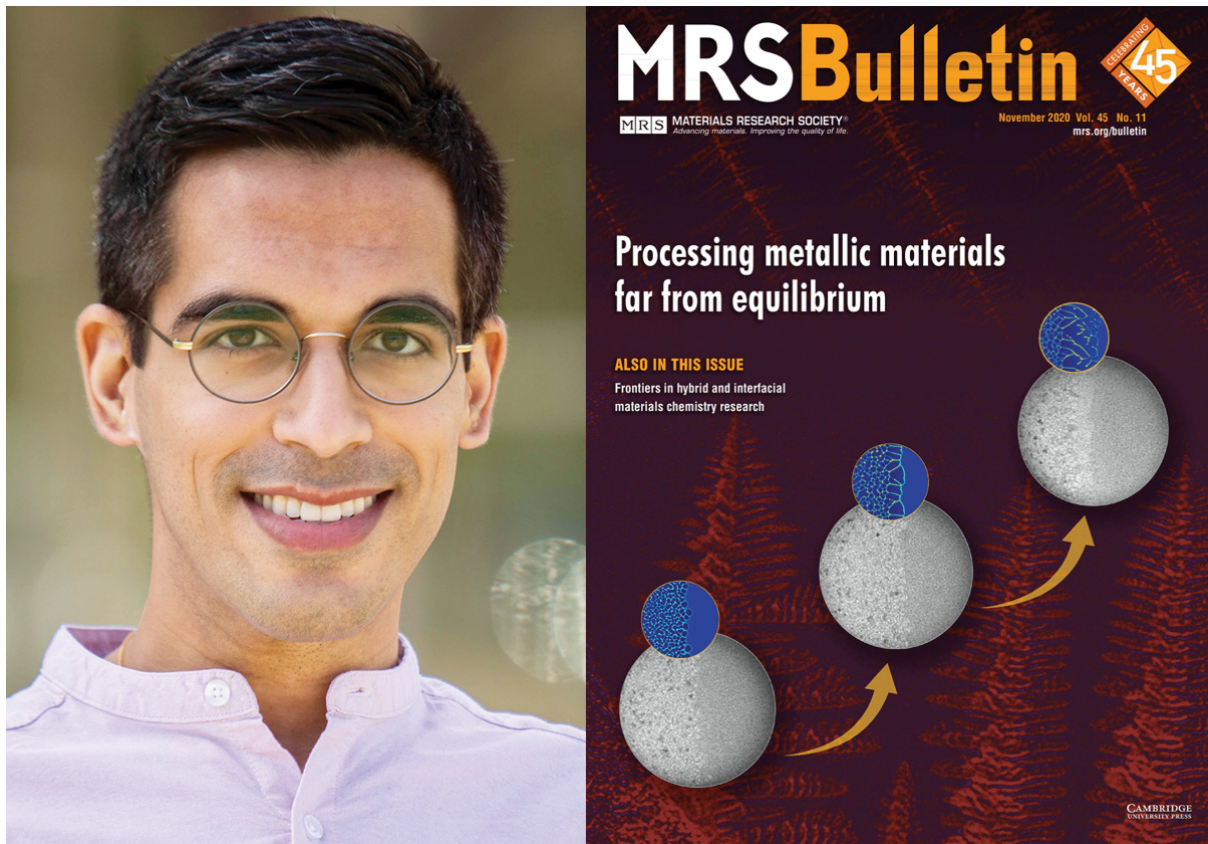
Play it safe

Whether it's [traveling safely](#) or keeping yourself and family members safe as you [celebrate the holiday](#), we encourage everyone to fight 'Covid fatigue' (which we all have!) and continue to help slow the spread of COVID-19 by social distancing, avoiding social

gatherings and wearing face coverings. With three promising vaccines on the horizon, the end is hopefully in sight, but, until then, it's important to stay vigilant!

Research Highlights

Shahani guest co-editor of special issue of MRS Bulletin; featured speaker at related webinar

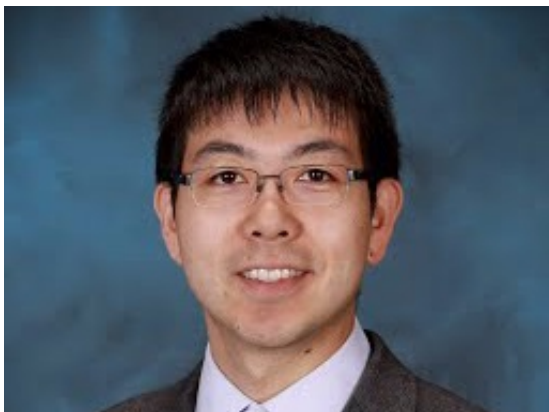


Assistant Professor Ashwin Shahani was recently invited to be a guest co-editor of the November 2020 MRS Bulletin. [Read more.](#) On Wednesday he will present "Processing Metallic Materials Far From Equilibrium" at a related MRS-sponsored webinar. See details below.

Upcoming Events

Shahani featured speaker at MRS webinar Nov. 25

Assistant Professor Ashwin Shahani will present "Processing Metallic Materials Far From Equilibrium" this **Wednesday, Nov. 25** from 12:00-1:30 p.m. The event is free but [registration is required](#). Click [here](#) for more information on the webinar.



Seminar speaker Dec. 4: ME's Yue Fan

Asst. Prof. Yue Fan will present "Behaviors of Structural Materials away from Equilibrium: a Tale of Two Solids by Hovering Over the Energy Landscape" **Friday, Dec. 4, at 10:30 a.m.** Zoom link: <https://umich.zoom.us/j/98581317232>
Passcode: 152643

MRS Virtual Conference

The Materials Research Society (MRS) virtual conference, Nov. 27-Dec. 4, is open to students to attend. Click [here](#) for registration information.

2020 Distinguished University Professorship Lectures - Dec. 4

Two of the three speakers of this prestigious event have courtesy appointments with MSE, **Professor Nicholas Kotov** and **Professor Victor Li**. The event will be held on Friday, December 4 from 3:00-4:30 p.m. Watch live at <http://myumi.ch/lbDUP2020>



Nicholas Kotov

Irving Langmuir Distinguished University Professor of Chemical Sciences & Engineering, Joseph B. and Florence V. Cejka Professor of Engineering, Professor of Chemical Engineering, Professor of Materials Science & Engineering, Professor of Macromolecular Science & Engineering, College of Engineering

Nanostructures in Nature

In this lecture, Professor Kotov will address the role of organic and inorganic nanostructure in the world around us, as well as the technological and humanitarian impact of this knowledge.



Victor Li

James R. Rice Distinguished University Professor of Engineering, E. Benjamin Wylie Collegiate Professor of Civil Engineering, Professor of Civil and Environmental Engineering, Professor of Materials Science & Engineering, Professor of Macromolecular Science & Engineering, College of Engineering

Harmonizing Our Built and Natural Environments with Bendable Concrete

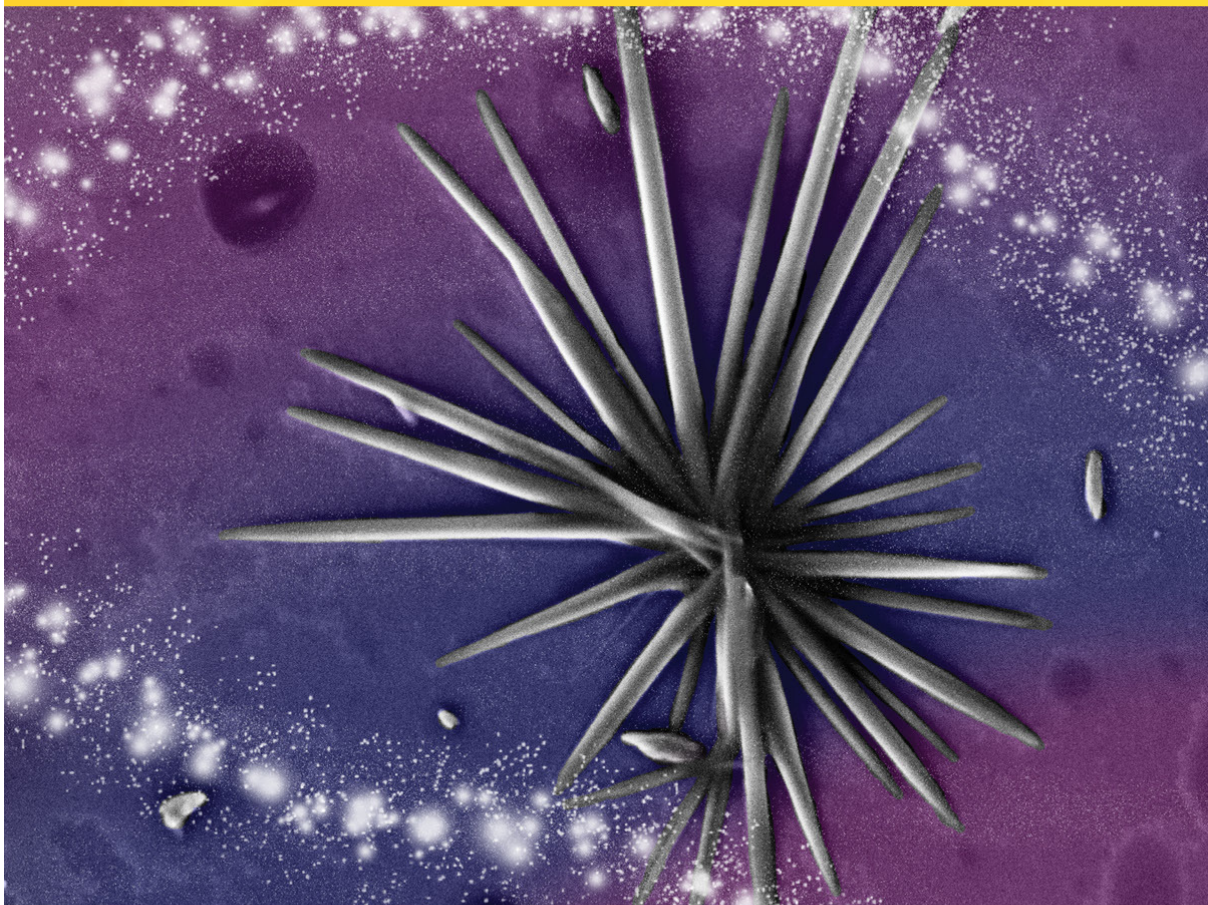
As our economies grow, the disharmony between our built environment and our natural environment has also grown. Concrete, for example, represents about 80% of all engineering materials consumed globally. As a building material, concrete has many advantages. However, the material embodied carbon and the operational carbon associated with repeated infrastructure repairs constitute a significant portion of man-made greenhouse gas that threatens our everyday life through climate change impacts.

Contests

We are excited to announce our 2021 calendar image contest winners! Thank you to everyone who submitted an entry this year. Below are our 14 winning images, which we hope will serve as early inspiration for the 2022 calendar!

“Nanofiber Star”

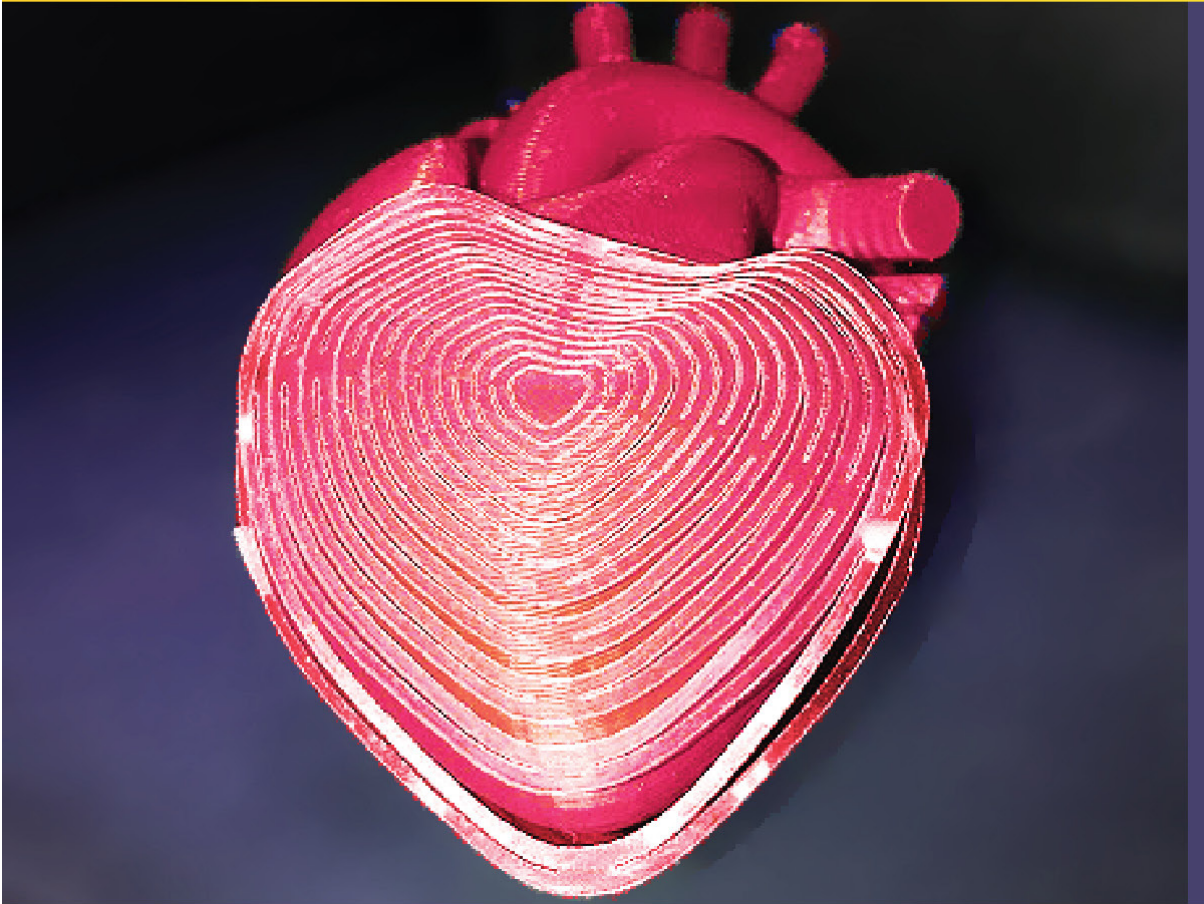
By Catherine Snyder (Mehta/Tuteja groups)



Self-assembled, fibrous PLGA nanoparticles imaged with SEM and colorized using Photoshop.

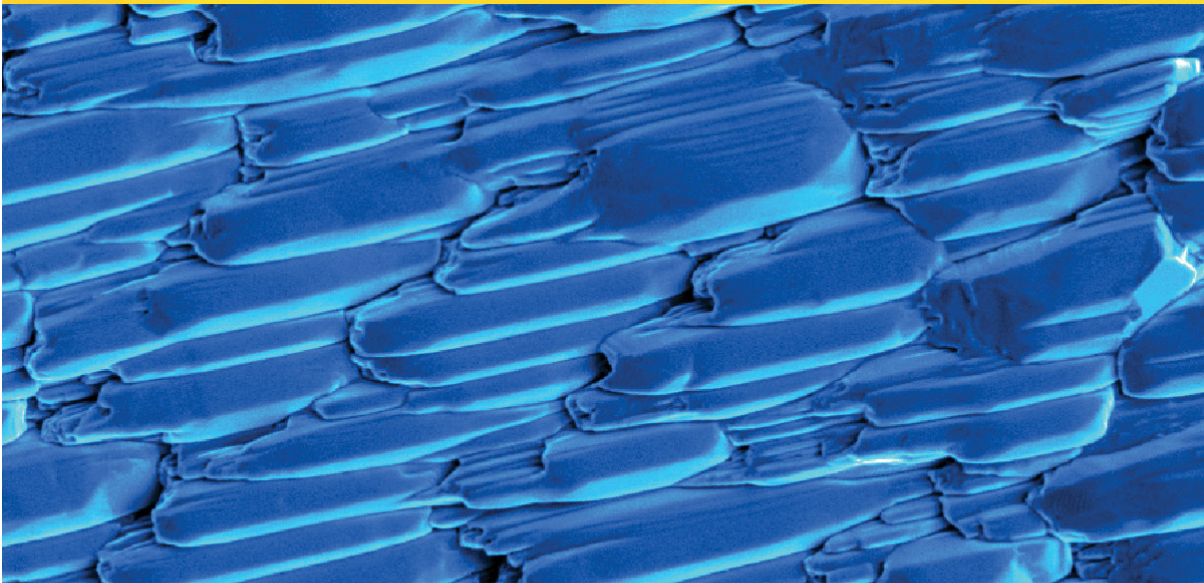
“Don’t go breakin’ my heart-igami”

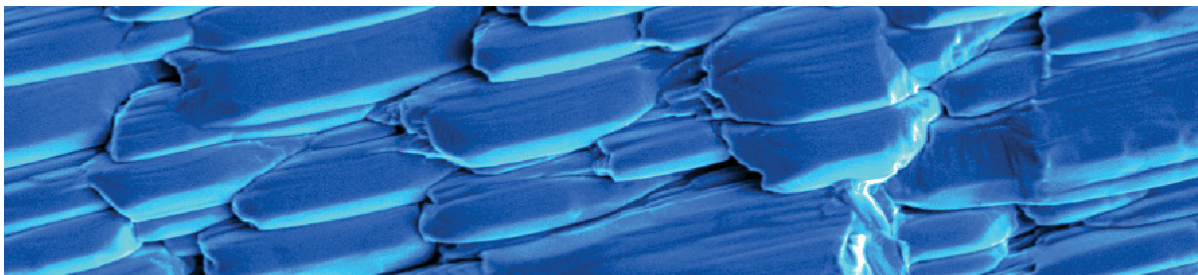
Don't go breakin' my heart again
By Erin Evke (Shtein group)



Rotationally symmetric kirigami pattern engineered to conform to the shape of a heart.

“Blue macaw feathers”
By Thomas Maulbeck (Marquis group)

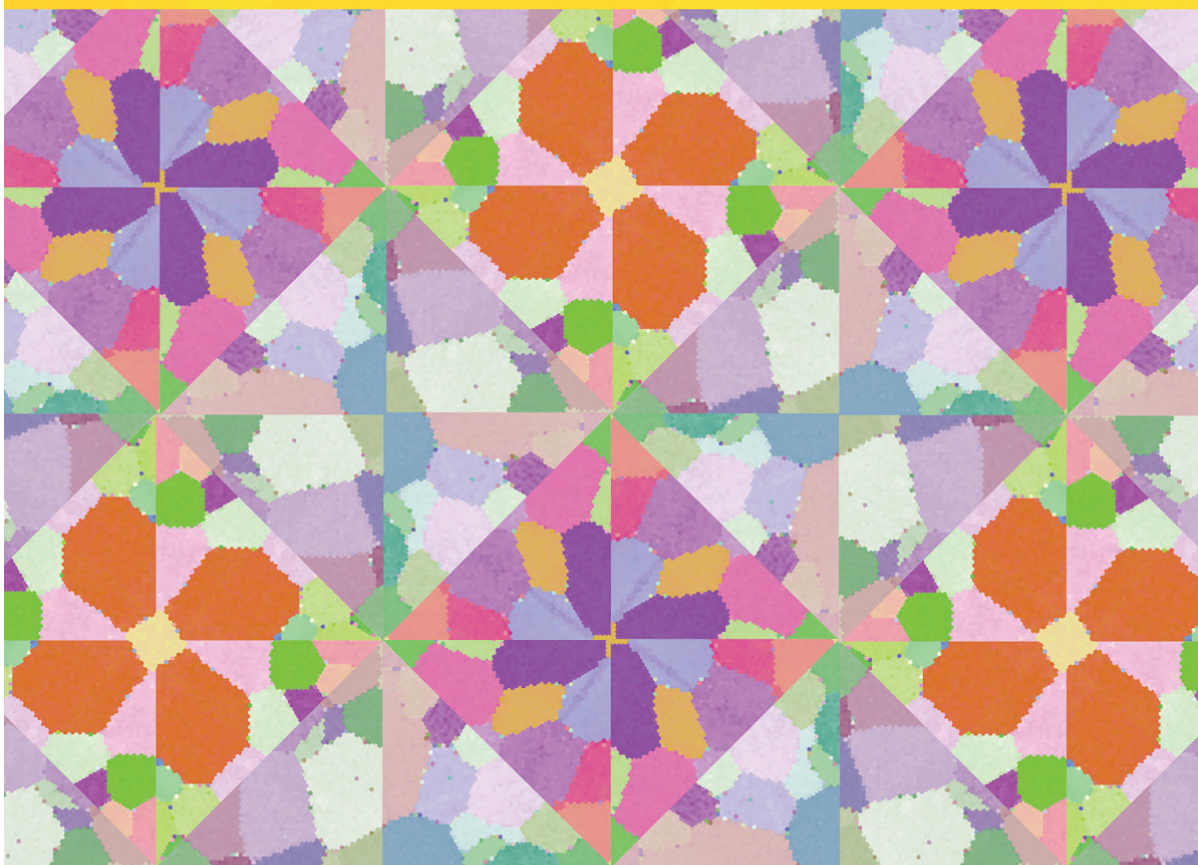




Top surface of an oxidized Ti-Si alloy, showing rutile TiO₂ with a feather-like morphology.

“Cubic Crystal Mosaic”

By Kathleen Chou (Marquis group)

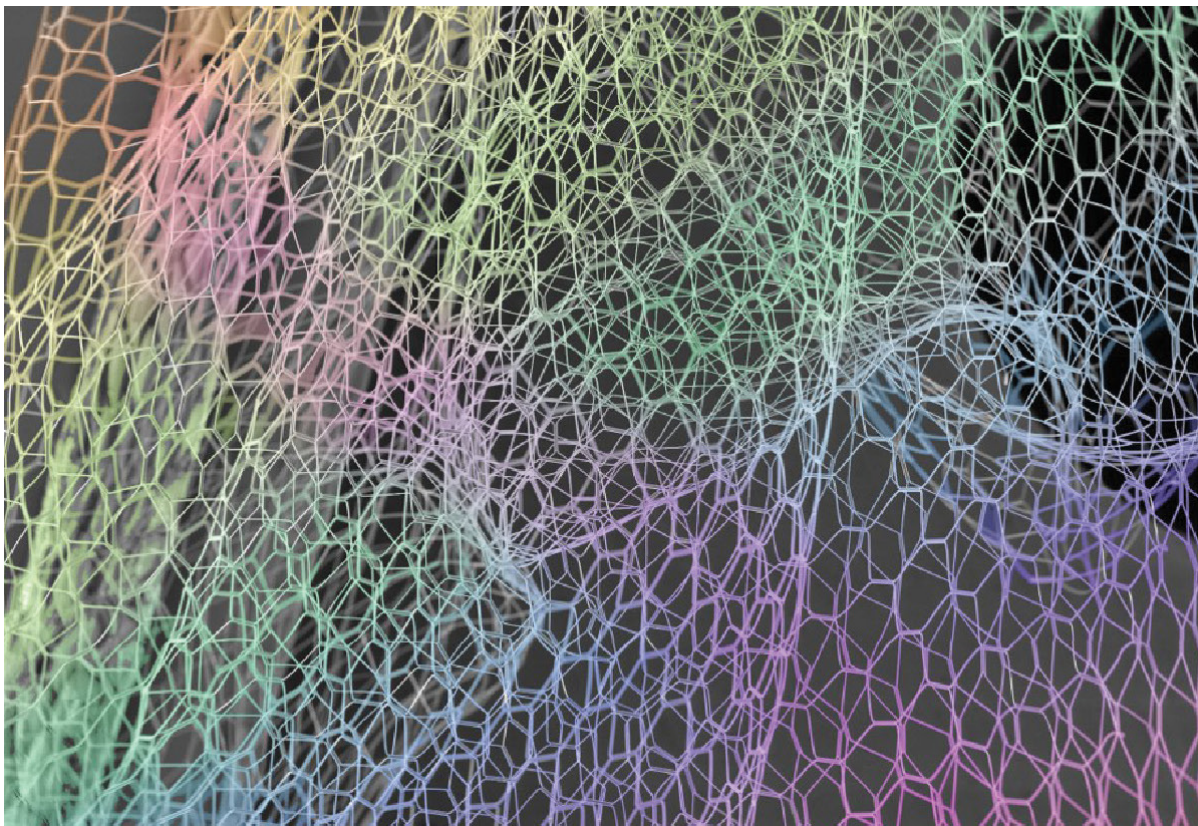


A beautiful mosaic tile pattern created from Electron Backscatter Diffraction (EBSD) maps showing crystal grain orientations in a titanium-niobium alloy.

“Microscale Kirigami Net”

By Wonjin Choi (Kotov group)





Microscale kirigami net made of parylene polymer sheet. Kirigami, the art of paper cutting, in micro scale enables a combination of mechanical and electrical properties typically unattainable in traditional metals, ceramics and polymers.

“Sunny Day in the Park”

By Mohsen Taheri (Misra group)

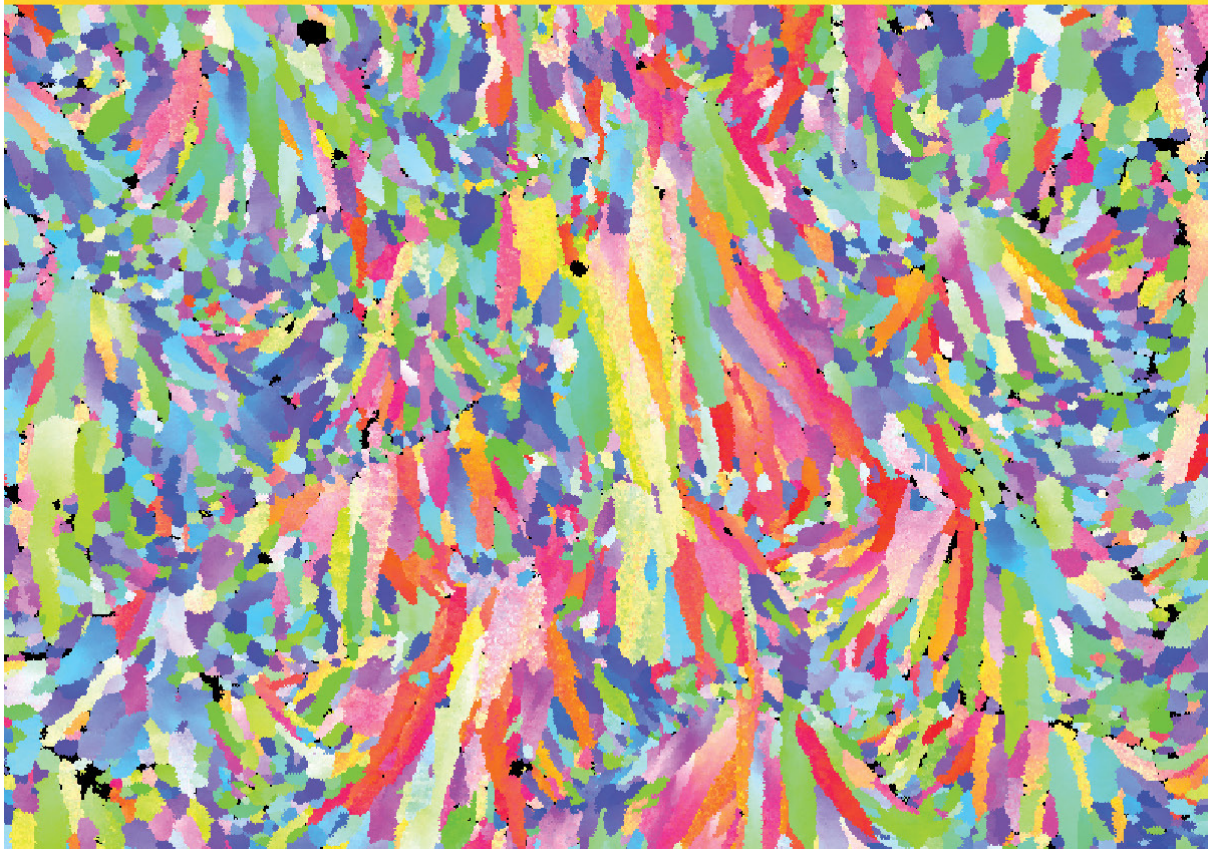




A High Resolution Kikuchi Pattern of Mg Alloys.

“Grand fireworks”

By Zhenjie Yao (Allison group)



EBSD IPF map of an Al-Si-Mg sample manufactured by laser powder bed fusion. This image illustrates the microstructural features along the build direction.

“Under the Sea”

By Juliane Scholtz (Marquis group)

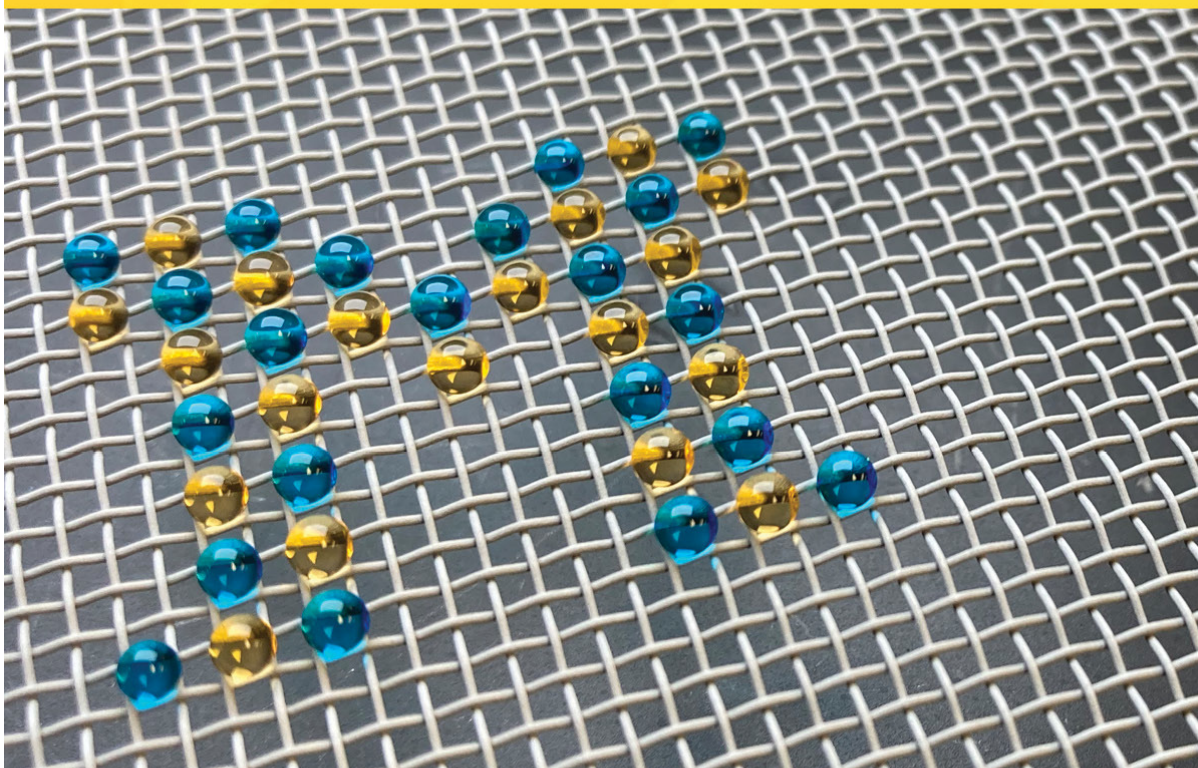




An intermetallic particle in an aluminum alloy prowls its way through an underwater kingdom in the form of a shark.

“Go Blue”

By Alex Kate Halvey (Tuteja group)



10 microliter colored water droplets suspended on a treated, super-hydrophobic aluminum mesh.

“Skull Party”

By Anshul Singhal (Taub group)



Optical Microscope image showing the cross section of a bamboo plant stem, revealing structural natural fiber cells inside (the skull's head and mouth here).

“Nature”

By Abhishek Dhyani (Tuteja group)

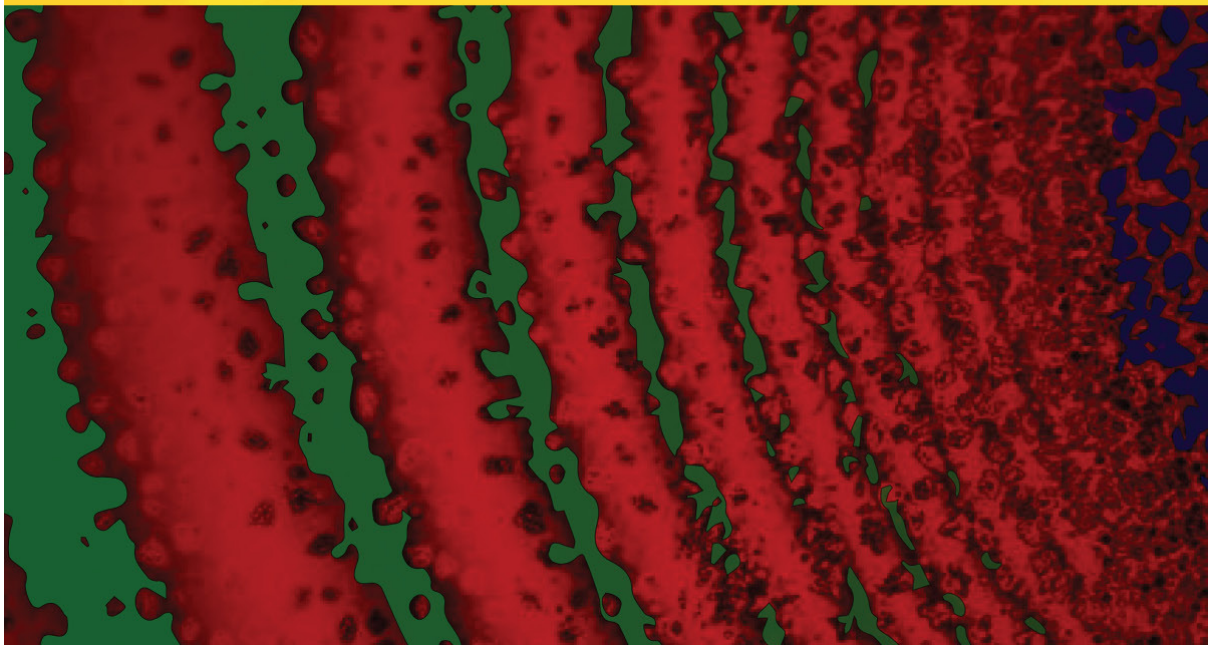


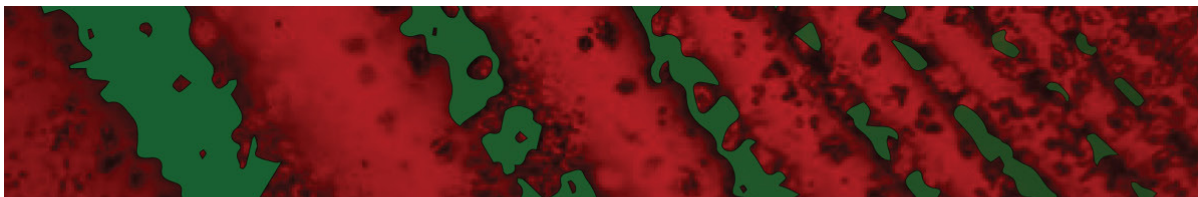


Bird's-eye view of Yasuni National Park, Amazon rainforest, Ecuador. (Right) Puddles of live, fluorescent bacteria (Escherichia coli) with sizes in the range of a few micrometers sit over a polyurethane surface. Just like animals and plants in most natural environments, bacteria species can compete for space and resources in continuously evolving ecosystems. Bacteria picture taken in Prof. J. Scott VanEpps's lab during collaborative projects with Prof. Anish Tuteja and Prof. Geeta Mehta. Rainforest picture courtesy of telegraph.co.uk.

"Holiday Ripples"

By Brian Iezzi (Shtein group)

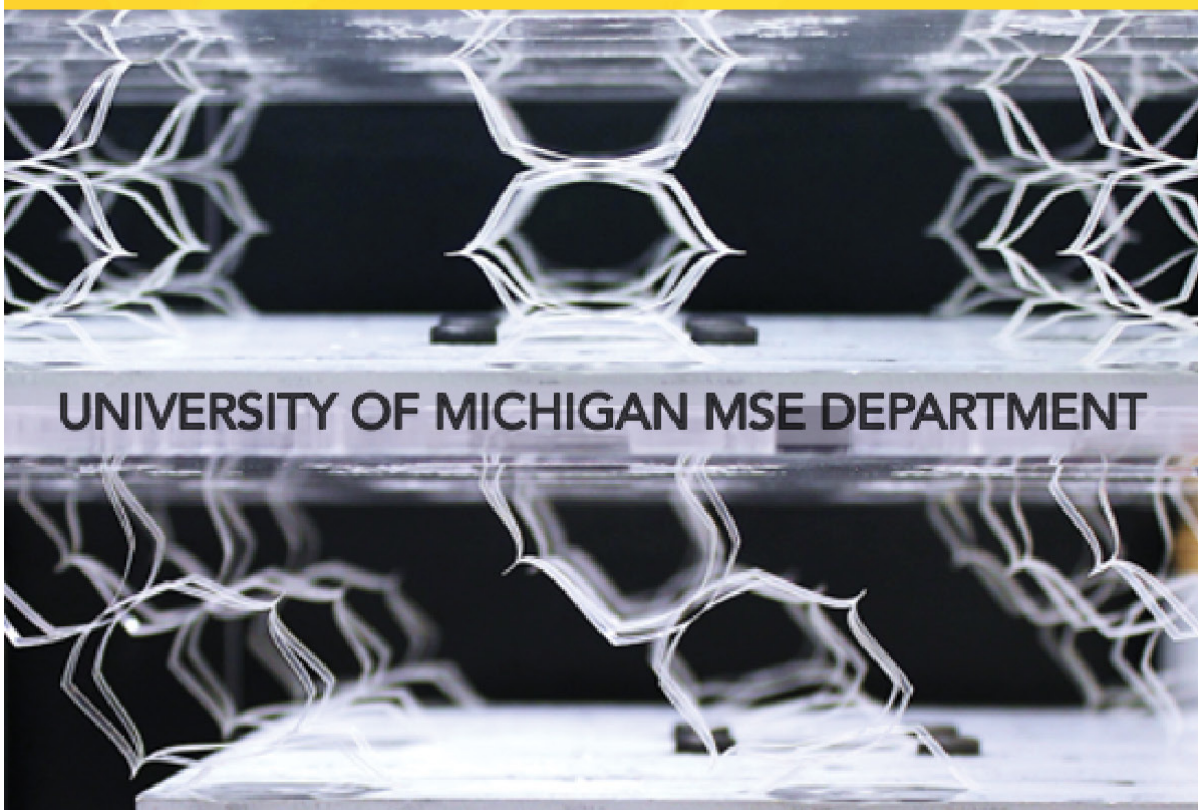




Optical micrograph of organic vapor jet printed thin film of a dye molecule, rhodamine. The “ripples” are caused by thickness variations in the thin film when viewed under a selective color filter.

“Hall of Springs”

By Erin Evke (Shtein group)

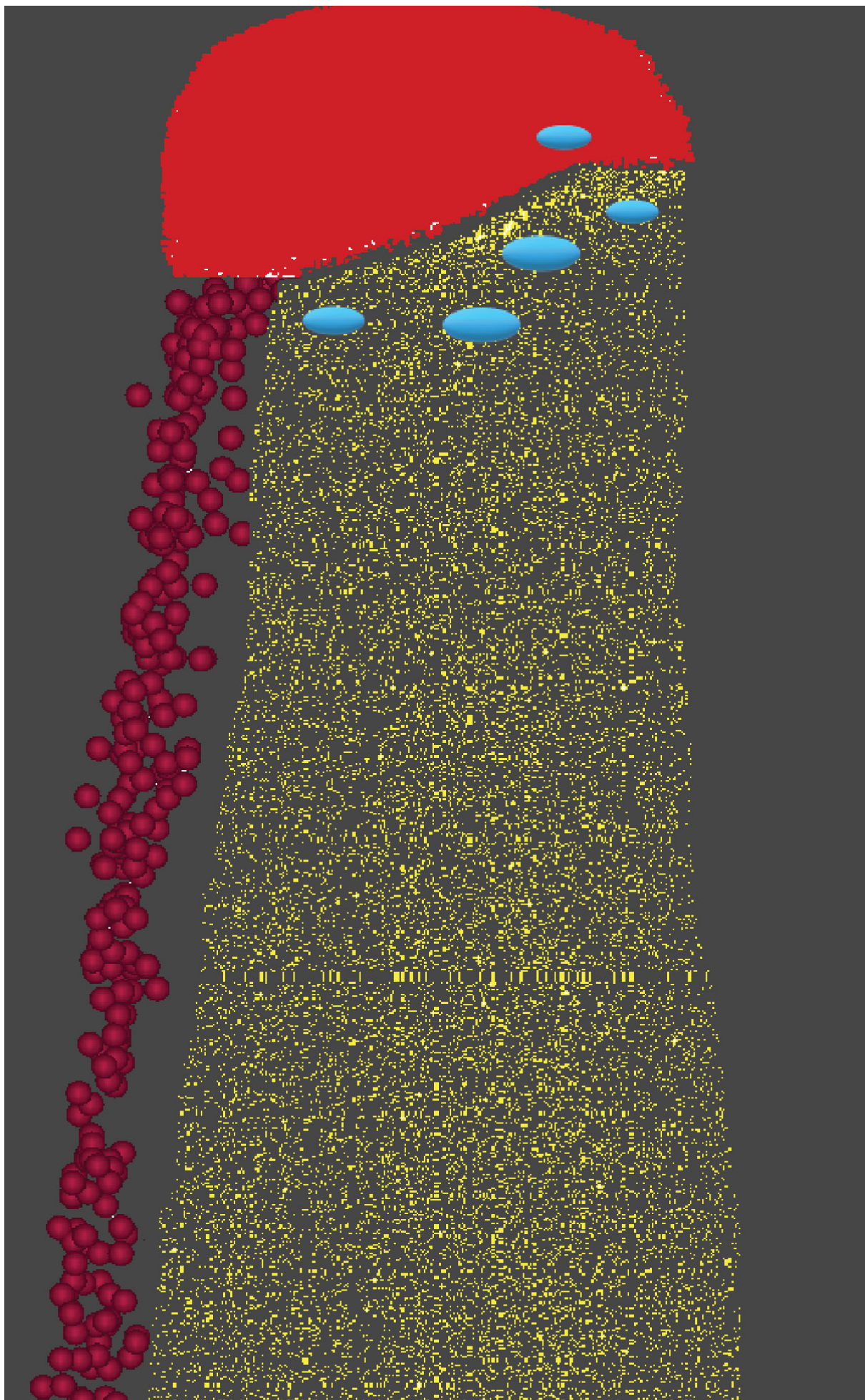


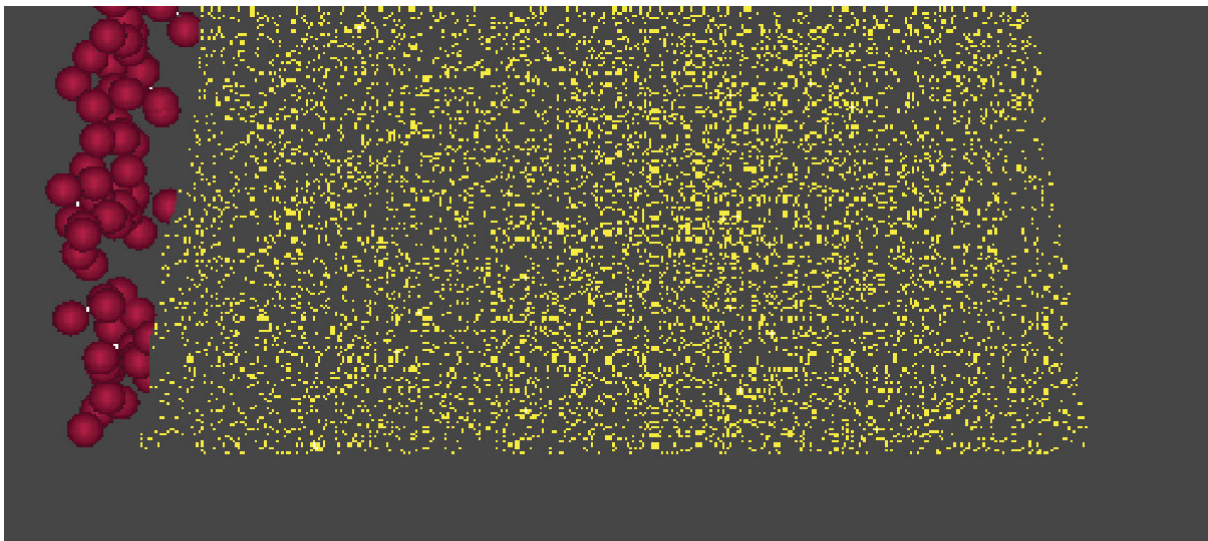
Kirigami-based multi-axis tracking array in the neutral state (top) and upon lateral translation (bottom)

“A streetlight hovered by blue flies on a dark night”

By Anshul Kamboj (Marquis group)







APT reconstruction showing Mn-Ni-Si precipitates (in blue), Mo carbide precipitate in orange, the brown line showing the grain boundary segregation of C and yellow region is the Fe matrix.





Internship – Polymer Engineering

Location Cupertino, CA USA | Remote based internship

Duration Up to 12 months, starting in January 2021

Responsibilities

- Perform applied materials research into new polymer materials for emerging product design needs
- Develop test plans in collaboration with senior material engineers and product design teams to drive material selection, design feasibility, and performance of new parts
- Work with external testing labs to characterize new materials
- Document and present results to polymer team, material suppliers, product design teams and reliability engineering

Qualifications

- Currently enrolled undergraduate or graduate student pursuing a BS, MS or PhD in Material Science, Polymer Science, Chemistry or Chemical Engineering
- Knowledge of materials and basic design principles
- Excellent laboratory and analytical skills, including design of experiments and data analysis
- Self driven with excellent written and oral communication skills

Apply

Send resume to Qian Zhang, q_zhang@apple.com, with subject "2021 Polymer Engineering Internship"



UM/INL Joint Seminar

Life at INL and Internship Programs

December 1, 2020

10–11am

Click here for link

Join us for an overview of the internship and postdoc programs and research/work experience at Idaho National Laboratory (INL). Hear from three INL scientists who graduated from U-M and three interns who will share their research experience from this past summer.

Agenda

Welcome and Introduction

(Dr. Peng Xu, Dr. Kevin Field, Dr. Brendan Kochunas)

INL Internship and postdoc programs

(Thomas Steele)

Research highlights by UM graduates and INL interns

(Dr. Andrea Jokisaari, Dr. Michael McMurtrey, Dr. Mukesh Bachhav, Pengyuan Wang, Olivia Licata, Mackenzie Warwick)

Discussion, Q&As, and future seminars

If you have any questions leading up to the seminar, contact **[Kevin Field at kgfield@umich.edu](mailto:kgfield@umich.edu)**.

DEI News

You're invited to this special DEI Webinar on Tuesday, Dec. 1!



GASLIGHTING IN THE ACADEMY Will Black Lives Continue to Matter?

Tuesday, December 1, 1:00-2:00 p.m.

In light of the increased visibility of the killing of unarmed Black people by police, there is a movement happening in America to address racial inequities across multiple facets of life, and neither the Academy nor STEM researchers are immune.

Overlaying the disproportionate effect of COVID-19 on Black and Brown people has led to a tipping point driving activism nationwide.

However, there is a risk that once the outrage passes, structures supporting systemic racism will remain, once again, gaslighting academics and students of color who thought that change was coming.

Professor Platt will uncover micro- to mega- activities that occur on a daily basis to sustain racial inequities, the toll it takes on recipients, and then suggest changes to be made from the personal to institutional level to promote anti-racist practices to transform the academic culture.

[RSVP for webinar here](#)

MSE Faculty & Staff: What we're thankful for this season...



“

I am thankful for my family and friends; for the students, staff and colleagues who I have the pleasure of working with; for good health - and for thigh deep, light powder one morning last winter on a steep slope in Utah :-)

–Professor John Allison

”

“

I am incredibly thankful for those Staff I have been working with this year. Their hard work and the spirit gave me the courage to overcome the difficulties during this year.

Vincent Qi, Senior Research Project Engineer

”

– Ting Qi, Senior Research Project Engineer

“

I am thankful for pumpkin everything!

–Tim Chambers,
Instructional Labs Supervisor

”

“

I'm grateful for our amazing MSE students, who bring sunshine into our days, even through zoom! I'm also thankful for the great materials characterization capabilities we have here at UM, and the critical support from the technical staff in MSE and at (MC)², and for the College and departments's financial support of these facilities.

–Associate Professor Becky Peterson

”

“

My sincere thanks to all students, staff and faculty who have gone out of their way to accommodate remote participation.

–Professor Alan Taub

”

“

I am thankful for my family and our good health, I couldn't get by without their support. I am also thankful for the help, understanding, and patience of all of our MSE family in these crazy times.

–Patti Vogel,
Undergraduate Program Advisor

”

“

I am thankful for all the faculty and staff that are working extra hard to make this semester as good of an experience as possible for our students.

–Professor Joanna Millunchick,
Associate Dean for Undergraduate Education

”

“

I am thankful for Science and the endless pursuit of knowledge through a career in Science that keeps me active and focused, even during the devastating pandemic. I am thankful for the all the

failures and setbacks that have taught me patience and perseverance in the quest for truth, and all my wonderful colleagues, friends and family for their support.

–Professor Amit Misra, MSE Chair



I am thankful for all the warm hearts in my life.

–Shelley Fellers, Administrative Assistant



I am thankful for healthy family, dedicated students, kind co-workers/colleagues, thoughtful friends, and good humor! Links for humor:

<https://youtu.be/h150kYuoMyE>

https://youtu.be/bye1_FpfVPU

–Associate Professor Geeta Mehta



I am thankful for God, my family's health, and the extra time I'm able to spend with my family during this pandemic.

–Tina Longenbarger, Executive Secretary



I am thankful for the opportunity to learn and grow from my collaborations with students and faculty. I am fortunate to have such wonderful colleagues!

–Assistant Professor Ashwin Shahani



I am thankful to work in the College of Engineering, where the leadership is people-focused and supportive of decisions that are caring and in the best interest of the person, be it a student, faculty, or staff member.

**–Todd Richardson,
Department Administrator**



I am thankful for good health and friendship.

–Ellen Hou,

Department of Mechanical Engineering





I am very thankful that I can be home and prepare a delicious turkey dinner with my husband for Thanksgiving, I am thankful for my job and that I get to work from home. We are blessed with all that God provides for our family. Happy Thanksgiving to all :)

–Debbie Johnson,
Procurement Specialist



*Have a Happy
and Safe
Thanksgiving!*



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Our mailing address is:

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3062 H.H. Dow Building
Ann Arbor, MI 48109

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TEAM M MISE

Alexa, can you please skip to 2021?

It's starting to feel like deja vu. With COVID cases dramatically on the rise across the country, it's time to hunker down. Again. There's a lot of important COVID and academic news to digest this week, so let's get right to it...

Questions, comments or ideas for TeamMSE? Contact Kristen at krisfres@umich.edu.

We'd love to hear from you!

Countdown to Closing



Lauren Duke '22 collects data for her final design project in MSE 360. Due to a new state order, today is the last day the Van Vlack Lab will be open this semester.

Campus COVID Status

State of Michigan implements three-week 'pause'

Due to an 'alarming' rise in COVID cases and deaths across the state, on Sunday Governor Gretchen Whitmer announced new restrictions for schools and business (see graphic below) that will go in effect tomorrow, Nov. 18.

What this means for CoE students

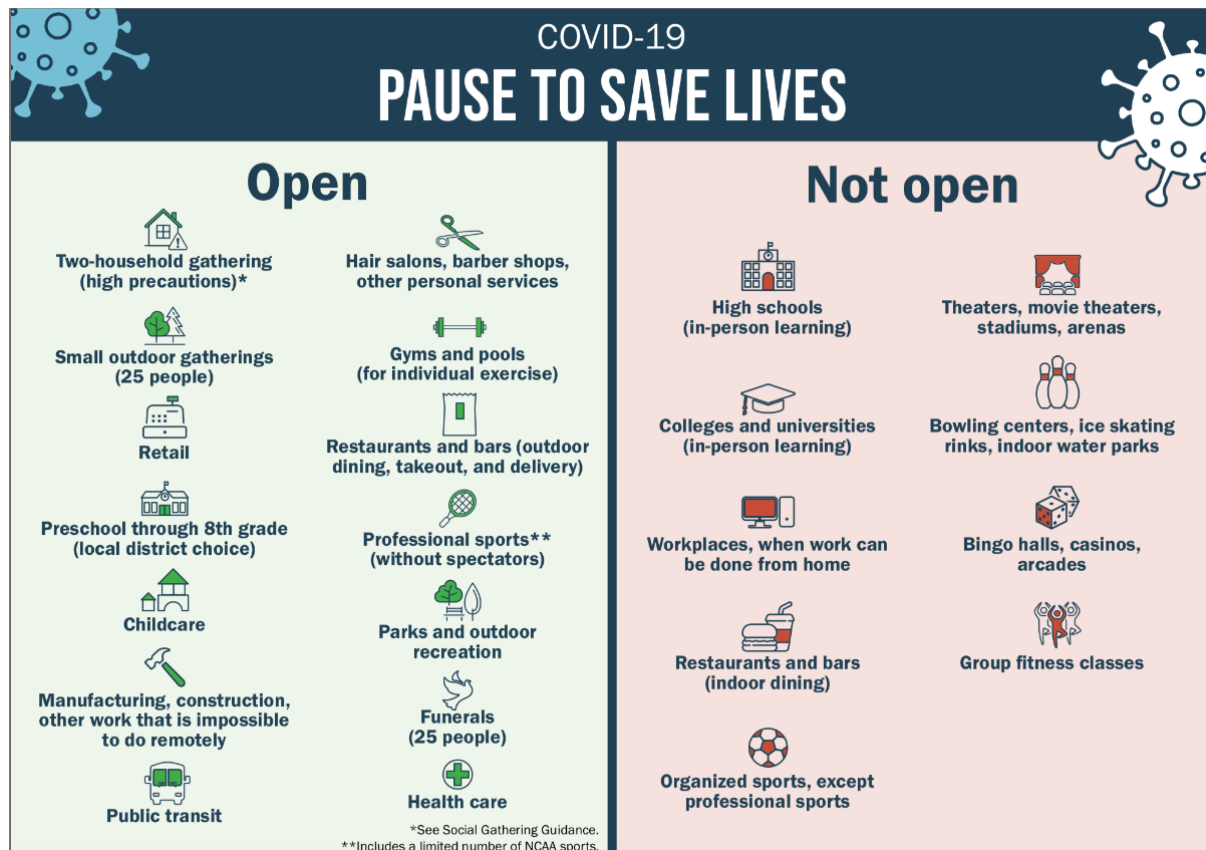
For the most part, this order just accelerates the adjustments planned for Nov. 20th by three days, which means all classes will move to remote instruction and instructional labs will close to students tomorrow (rather than on Friday). Research teams, however, can continue with their research. Research labs will remain at 60 percent density.

Other campus impacts include:

- The university's recently announced plan for the winter semester that begins Jan. 19 calls for **undergraduate students who don't need to live on campus to remain at their permanent residences to reduce density in U-M residence halls.**
- Residence halls and dining facilities (take-out only) will remain open. Campus recreational facilities are limited to 25 percent capacity, and 12 feet of separation must be maintained at exercise stations.
- There also will be increased testing, mandatory each week for undergraduates who live on campus or attend in-person classes or activities, perform research, use facilities such as libraries, unions or Recreational Sports, or work on campus.
- Weekly asymptomatic testing will be available for all graduate, professional and undergraduate students who are not otherwise covered by a mandatory program, as well as staff and faculty working or teaching on campus.

[Read more.](#)

The graphic below illustrates what schools and businesses in Michigan are open as of tomorrow, November 18.



Additional grading options announced

In recognition that the pressures and stress brought on by the current circumstances may mean that students' performance in courses will not accurately reflect their abilities, U-M announced some modifications to grading for the Fall 2020 and Winter 2021 terms, as detailed below.

For Undergraduates

- All undergraduate students will have the option to change letter grades of A+ through C- to "Pass." This option is available for all classes.
- Students will make this decision after the letter grade is posted. The deadline for requesting a change from a letter grade to "Pass" is July 1, 2021 for the Fall 2020 term, and November 1, 2021 for the Winter 2021 term.
- Students who already elected a fall 2020 course grade as Pass/NRC will have the option to change to a letter grade.
- This decision will be a one-time election; in other words, a student cannot convert a letter grade to a P and later ask to go back to the letter grade, or vice versa.
- P grades can be used to satisfy requirements as long as the letter grades earned would meet the requirements. Other academic policies remain unchanged.
- The requirements for determining various academic honors such as Angell Scholars and University Honors remain unchanged.
- Students are strongly encouraged to work with their advisors before deciding to convert a letter grade to a "Pass" to ensure doing so does not cause any unintended consequences given degree requirements or future plans.

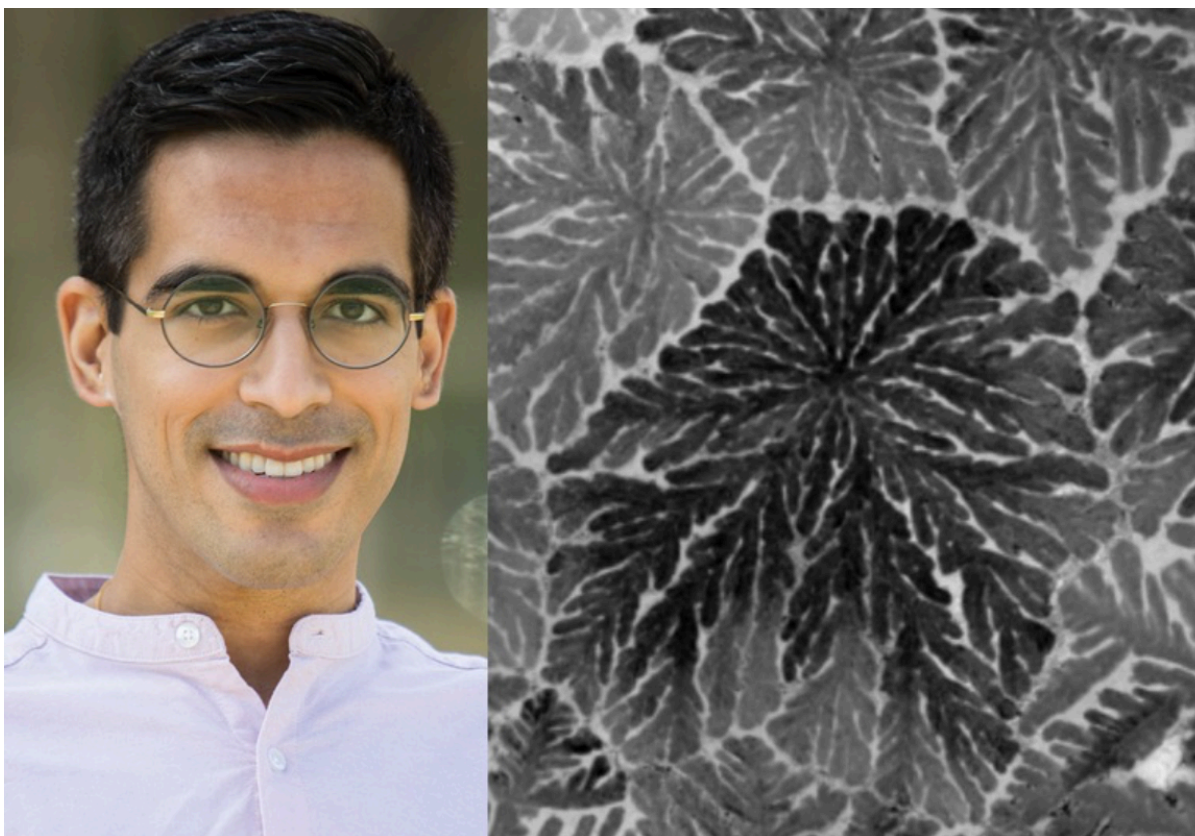
For Graduate Students

- Instructors will submit letter grades for all graduate students enrolled in Rackham programs. A modified grading system will award letter grades of A+ to B- and a notation of "NRC" (No Record COVID) for grades of C+ to E. Additionally, students will now have the one-time option to change any or all of their letter grades of A+ through B- to S (Satisfactory).
- Students will be able to view any letter grade recorded as NRC and decide whether to convert the notation. Students with grades of C-, C, or C+ may choose to earn course credit by converting the NRC to a letter grade. Letter grades of D or F do not receive Rackham credit.

[Read Rackham academic policy.](#)

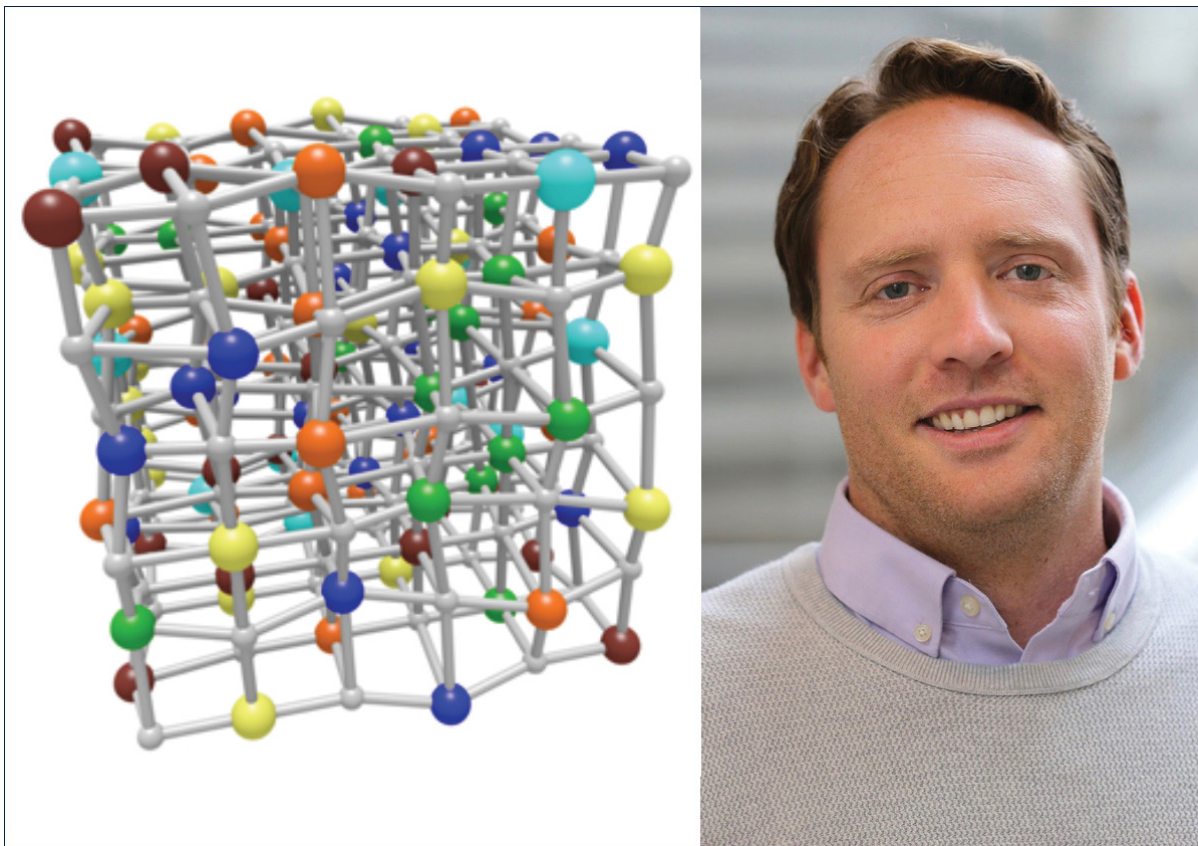
Research Highlights

Discovery of 13-atom clusters could mean control in manufacturing materials far-from-equilibrium



In their latest research, the **Shahani group** upends conventional wisdom by showing that quasicrystals grow dendritically from a solid phase precursor, not just under a liquid-to-solid transition. [Read more.](#)

Three Heron group projects receive combined \$900k+ in funding



The new funding gives a boost to the **Heron group's** goals of designing otherwise unstable complexes in correlated oxides, advancing transformative performance in memory and logic devices, and realizing chemically identical yet electronically distinct nanoscale thin film superlattices of materials. [Read more.](#)

Upcoming Events



Seminar speaker this Friday: Stanford's Kunal Mukherjee

Kunal Mukherjee, an assistant professor at Stanford, will present "Epitaxial integration of dissimilar semiconductors for infrared optoelectronics" this **Friday, Nov. 20, at 10:30 a.m.** Zoom link:

<https://umich.zoom.us/j/91589913796>

Passcode: 633466

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DEI LECTURE SERIES

Manu Platt, Associate Professor at Georgia Institute of Technology

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