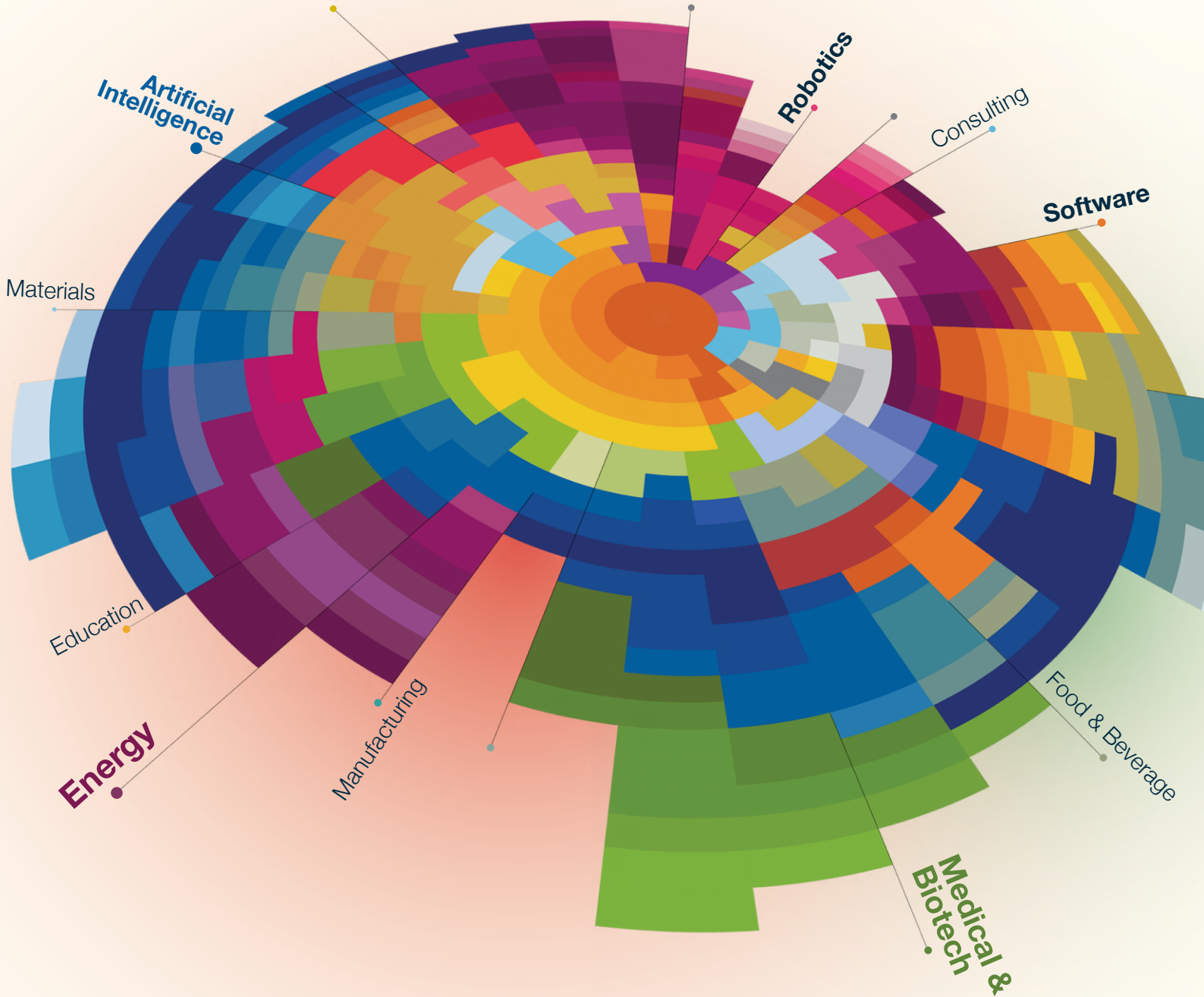


MechE CONNECTS

Spring 2026



MECHE BORN ENTREPRENEURSHIP

The MechE Innovation
Landscape
P.4

The Founder's
Journey
P.10

Remembering a
Pioneer
P.16



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Dr. Martin Klein '62, a member of the MIT Sea Grant Advisory Board and the MIT Museum Collections Committee, is known as the father of commercial side-scan sonar. To celebrate Dr. Klein's 85th birthday, and in an homage to his classmate Oliver R. Smoot, Jr '62, who was famously used by his fraternity to measure the Harvard Bridge in 1958, an MIT team recently rolled out a new unit of measurement: measuring the nearby Longfellow Bridge in units of Klein. Credit: Gerardo Berlanga



About MechE

The MIT Department of Mechanical Engineering – MechE – advances the design, fundamental principles, and realization of physical systems with mechanical engineering at their core. Our research and education programs embody MIT's motto “mind and hand,” as well as “heart,” combining theory and hands-on learning with a commitment to make the world a better place. By uniting the core areas of MechE with emerging frontiers, we discover new knowledge, create innovative technologies, and train future leaders who help address the biggest challenges facing our society.

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Cover:

Visualization of the focus areas of hundreds of companies founded by MechE alumni, students, and faculty since the early 2000s.

Credit: Wing Ngan

Have updates or news to share with the MechE Community? Would you like to share an idea for a future issue of MechE Connects?

Email us at mecomms@mit.edu



“Through courses, new programs, and deeper connections with alumni we hope to grow MechE’s culture of entrepreneurship – not only to catalyze the formation of new startups from MechE labs, but also to accelerate the pace of discovery and elevate the impact of our education and research activities.”

Dear MechE Alumni, Students, Faculty, Staff, and Friends,

MIT gives many people the entrepreneurship bug. We have an incredible legacy of successful companies founded by MIT students and alumni, and many supporting programs across the Institute. This ecosystem inspires confidence in aspiring MIT entrepreneurs and catalyzes enthusiasm in each new generation of ideas.

Since becoming department head nearly three years ago, and through my own experience working with companies young and old, I have focused on growing a culture of entrepreneurial thinking—not only to catalyze the formation of new startups from MechE labs, but also to accelerate the pace of discovery and elevate the impact of our education and research activities.

In this issue, we’re exploring *MechE Born Entrepreneurship*. Last summer, we embarked on a research project to help us better understand the innovation landscape connected to our department – and found more than 300 companies launched by MechE alumni since 2010. I’m sure the actual total is much larger than that.

Here, you’ll read about MechE entrepreneurs active in biotechnology, energy, and artificial intelligence—three of the largest categories of recent MechE-born startups. We also introduce you to a new class that brought the first-hand stories of MIT alumni entrepreneurs to MechE students; a recent 2.009 project that is being brought to market; and much more.

Our students today want to drive rapid cycles of learning, solve new problems by combining hardware with computing, and embrace the fundamentals of MechE through our iconic hands-on courses. Entrepreneurship is an integrative tool to build upon these foundations, and for some of our students and alumni, it becomes their passion and career. We hope you enjoy this issue, and the celebration of the MechE founder’s journey.

With best regards,

A handwritten signature in black ink that reads "John".

John Hart
Class of 1922 Professor
Department Head

The MechE Innovation Landscape

Hundreds of companies founded by MechE alumni are active in biotech, AI, energy, robotics, and many other fields

By David Chandler

According to research conducted by MechE graduate student Jadal Williams last summer, well over 300 companies have been founded by MechE alumni since 2010. Geographically, the companies he identified span the more than a dozen U.S. states and several other countries around the world and, in many cases, they were a direct result of research the founders carried out as part of their MIT studies.

MechE-born companies have produced innovations that have had a significant impact on a wide variety of fields, with the largest concentrations of recent companies in three sectors: artificial intelligence and machine learning, biotechnology, and energy.

Hyunwoo Yuk, founder and CTO of SanaHeal, a company developing adhesive materials that have the potential to revolutionize the treatment of traumatic injuries and the control of bleeding during surgery, says the company “spun out of MIT mechanical engineering research I did during my Masters and PhD program,” where he and collaborators developed “a class of biomaterials that can stick to wet and bloody surfaces.”

It all started, Yuk says, with “the research work and publications we wrote as a team in mechanical engineering, myself and my PhD advisor Xuanhe Zhao, and we had a large group of postdocs and grad students that I closely worked with.”

The company’s first product, soon to be released, will be for care of trauma bleeding, because this indication may not require clinical trials to secure FDA clearance. “Obviously, when you have a technology that can literally seal off a wet and bleeding tissue, this is the most immediate and dramatic application — you can think of it as like duct-taping leaking blood vessels instead of leaking pipes in your basement.” The product is expected to be used by the military for emergency care in the field, and for emergency care by EMTs or in trauma centers in hospitals. The next products in the pipeline, Yuk says, will be to control bleeding in surgery, using material that will be degradable and resorbable in the body, as well as

More than

300

Companies launched
since 2010





Hyunwoo Yuk, founder and CTO of SanaHeal. Credit: Courtesy of SanaHeal

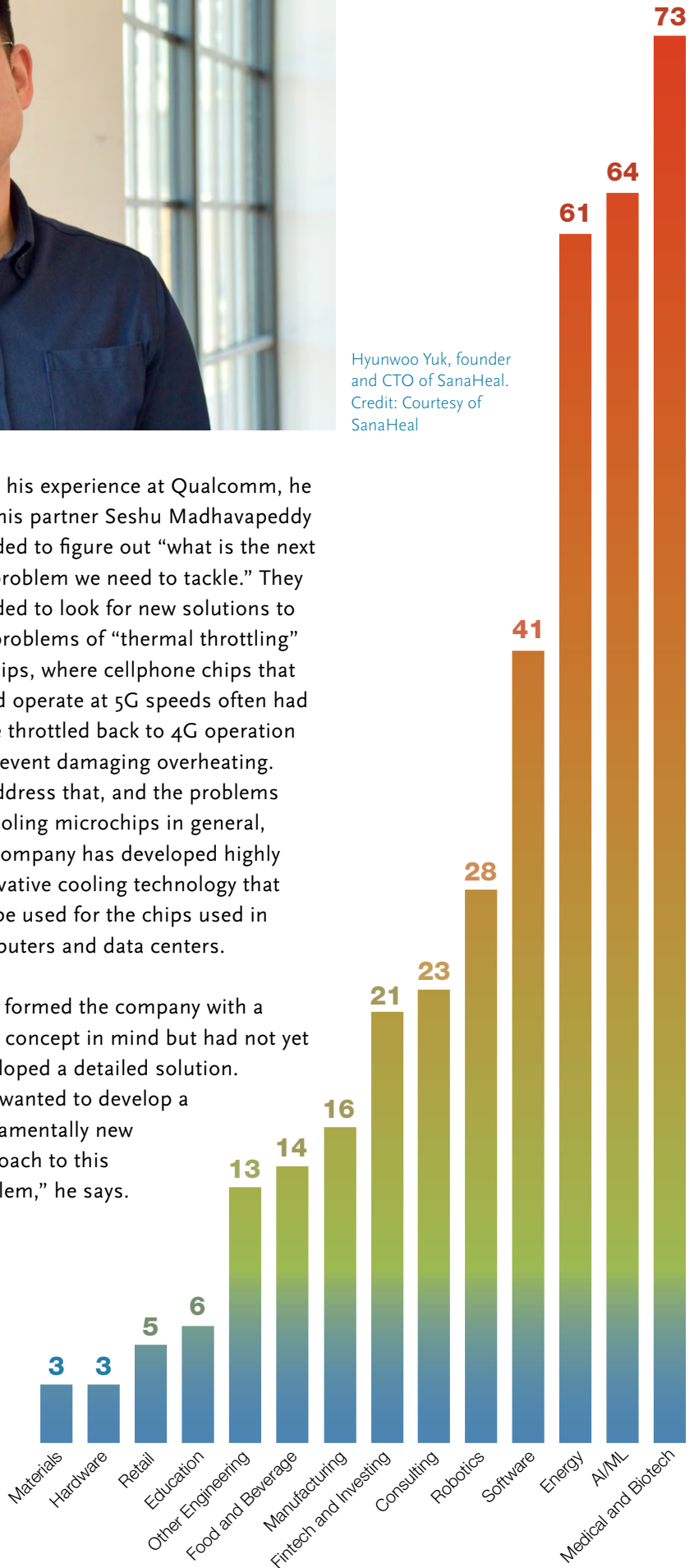
surgical meshes and adhesives for nerve repair. The company concentrates on research and development, partnering for the manufacturing and distribution to established companies.

The potential applications, he says, go beyond anything he or their team ever imagined. “It turns out that sticking something is such a universal activity, in a way, that you can find many applications.” As a result, the company is working on so many different variations of the material that, “It’s a hard company to run,” he says, “but it’s a good problem to have. If a startup has too much work to do, I think it’s a good thing.”

While many alumni-founded companies grow directly out of research carried out during MIT studies, others begin much later, many years after graduation, yet draw significantly on the skills, innovative spirit, and personal connections forged during those years. Suryaprakash Ganti, co-founder and CTO of Frore Systems, received his mechanical engineering PhD from MIT in 1997, and then spent years working at GE and then at Qualcomm, before starting the new company in 2018.

After his experience at Qualcomm, he and his partner Seshu Madhavapeddy decided to figure out “what is the next big problem we need to tackle.” They decided to look for new solutions to the problems of “thermal throttling” of chips, where cellphone chips that could operate at 5G speeds often had to be throttled back to 4G operation to prevent damaging overheating. To address that, and the problems of cooling microchips in general, the company has developed highly innovative cooling technology that can be used for the chips used in computers and data centers.

They formed the company with a clear concept in mind but had not yet developed a detailed solution. “We wanted to develop a fundamentally new approach to this problem,” he says.



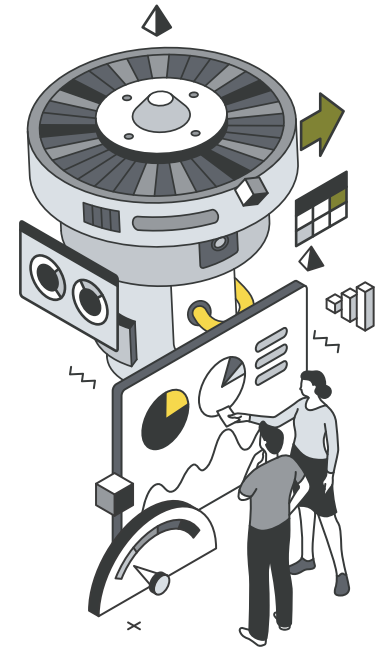
“It took us about six months with a very strong team. We hired very bright people both from MIT as well as from Stanford, people that helped us develop our core idea into an engineering design.”

The solutions they developed, unlike traditional chip cooling technology based on mechanical fans, uses variants of the technologies used to manufacture silicon chips, and so can be rapidly adapted to mass manufacturing methods. They realized silicon itself was not suitable for their purpose, but similar manufacturing processes could be adapted to work with other materials. “We developed a completely new technology in terms of

manufacturing using metal etching and using metal-based structures.”

They use wafers of metal precisely etched with complex patterns of channels that drive air through at extremely high velocity, producing jets of air strong enough to eliminate the issue of boundary layers of air that form a kind of blanket over the surface being cooled and thus reduce the heat transfer efficiency. With no real moving parts except ultrasonic vibrating structures inside, the new devices are virtually silent in operation.

Because they are using technologies based on silicon chip manufacturing, Ganti says they expect to be able to



Suryaprakash Ganti, co-founder and CTO of Frore Systems. Credit: Courtesy of Frore Systems

keep improving performance steadily in a way similar to the “Moore’s Law” exponential improvement over time. Already, their cooling systems have enabled the design of a computer about the size of a coffee cup saucer, one-fifth as thick as a Mac Mini but with better performance, he says.

The latest version of their technology, to be introduced next year, addresses the more intense cooling needs of data centers, and can cut in half the amount of water needed for chip cooling in these centers while also reducing the energy needed, potentially helping to solve major issues facing the proliferation of these centers.

Recalling his MIT experience, working under Professors David Parks and Frank McClintock, Ganti says “the mentorship and advice they gave me was excellent, in terms of how they taught me completely to reimagine the material science part of it as well as mechanical designs.”

When he worked at GE on a wide range of different consumer and industrial projects, he says, he had “the confidence that was primarily because of the ability that MIT has taught us actually to be able to attack all these hard problems that others can’t go after... MIT gave us a broad education, not only in mechanics and materials, but also in manufacturing and control systems. So that gives you the depth and breadth that is needed to be able to go after these problems.”

Many companies founded by alumni of the department have involved a fusion of mechanical engineering and computer science, making use of rapidly developing artificial intelligence and machine learning processes. For example, Akselos applies advanced computational techniques to the design and operation of massive energy-related engineering projects, including oil and gas facilities and offshore wind turbines.

Thomas Leurent SM '01, co-founder and CEO of Akselos, says the idea for the company took shape nearly a decade after he earned his degree, after having worked in various industries in between. Returning to MIT, he was introduced to Phuong Huynh, who was a postdoc at MIT at the time, and research scientist David Knezevic, who Leurent describes as “a born entrepreneur.” They came up with the idea for applying advanced computation techniques to the finite element analysis that are standard in large engineering systems, to find ways to safely manage some of the world’s most critical infrastructure, while maximizing its performance and lifespan. They quickly decided to pursue it, going to MIT’s Venture Mentoring Service for help.



Thomas Leurent SM '01, co-founder and CEO of Akselos. Credit: Courtesy of Akselos

The VMS staff expected that Leurent and colleagues might have spent many months already working to develop their plans. But Leurent had worked with VMS before and knew people there well, and said “‘We just met last week, but this is big, we should try it.’ And so they assigned us five fantastic mentors, who between them had worked with a half-dozen companies on the NASDAQ. A really great team.”

They initially spent five years developing the company in stealth mode, with help also from MIT’s Industrial Liaison Program, through which they eventually met with a team from Shell that was looking for technologies that could drastically lower the capital expenses needed for future large-scale energy projects. “And they came across what we were doing, which is a super-high-speed simulation of mechanical engineering,

“The MIT ecosystem for ventures is absolutely extraordinary...”

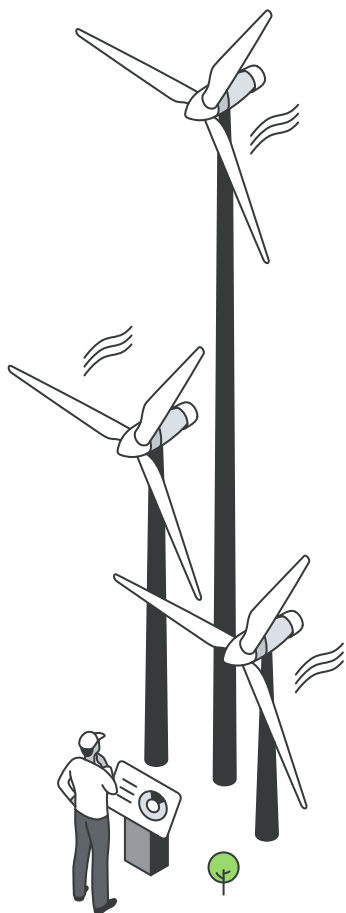
– Thomas Leurent SM '01, co-founder and CEO of Akselos

“MIT gave us a broad education, not only in mechanics and materials, but also in manufacturing and control systems... that gives you the depth and breadth that is needed to be able to go after these problems.”

– Suryaprakash Ganti, co-founder and CTO of Frore Systems

that make hundreds of billions of dollars of turnover per year.”

That partnership helped Shell win a Global Lighthouse Network award, for sites that are at the frontier of usage of revolutionary industrial technologies. Meanwhile, Akselos continued to expand their portfolio, moving on from oil and gas production and handling facilities, including offshore oil platforms, and on to offshore wind facilities as well. Using their simulation methods, he says, “we can cut the amount of steel by 25 percent in the foundation of floating wind facilities,” he says. They have since expanded to simulating chemical facilities, such as those that produce agricultural chemicals, as well. The company has a global presence, with facilities in Boston, Switzerland, and Vietnam.



and they’re like, okay, that should be one of those.”

The company signed a contract with Shell in 2015, which they drew up at their kitchen table, to work on the development of a new floating production and storage operation (FPSO), a massive project that he describes as being “like you take the Empire State Building and put it horizontally in the water, in kind of unfriendly water.” These projects “are just massively complicated to simulate, if you want all the details.” The project went well, and Shell invested in the company in 2018.

That’s the kind of partnership they’ve focused on, he said. Rather than looking for hundreds of customers, they wanted maybe a couple of dozen, “but the partnerships might be companies

Leurent says that “the MIT ecosystem for ventures is absolutely extraordinary, so you just have to tap into this again and again.” He and his team drew great inspiration from the book “Inside Real Innovation,” written by MIT professors, that stresses the importance of spending time in an iterative process, cycling between technology, markets, and products. “Each iteration impacts the others, and so on,” he says, “until you find the right fit.”

As SanaHeal CTO Yuk puts it, “it’s fun to write papers in fancy journals, but at the end of the day, I think for mechanical engineering as a discipline, the spirit is really in the associated impact, through productization. I think it’s basically the core spirit of the discipline... I still believe that mechanical engineering’s very root and the core is industrial impact.”


Industrial Innovation

Institute-wide effort with strong ties to MechE aims to catalyze innovation in manufacturing and drive productivity growth across the country

Yuk adds, “I feel like I had great fun in my academic career at MIT, which I believe is half of my kind of identity. And then I feel like I’m finding the other half of my identity when I get out into industry.”

Over the years, many hundreds of MechE graduates have now had the opportunity to make that transition, and in so doing have made a major impact in the world.

Anecdotal evidence suggests that MechE students and faculty are launching companies at an increasing rate, observes MechE Department Head John Hart. Other recent MechE-born startups include Fourth Power, co-founded by Professor Asegun Henry to commercialize large-scale thermal energy storage technology; Spheric Bio, co-founded by Connor Verheyen PhD ’23 and Professor Ellen Roche to develop a 3D heart implant to help prevent strokes; and Fabri, co-founded and led by Steven Davis ’24, which is building data-driven, automated metal casting foundries to support the U.S. industrial base.

And while many MechE alumni-founded companies are based in the Boston area, Silicon Valley is also a hotbed of activity, from hardware to software, including the headquarters of Rivian, founded by RJ Scaringe SM ’07 PhD ’09; Genspark, co-founded by Wen Sang, PhD ’13; Rox, co-founded by Ishan Mukherjee MEng ’11; and Matter, co-founded by Adi Ranjan MEng ’14 and Adi Prasad MEng ’15. 


Announced in 2025, the Initiative for New Manufacturing (INM) is an Institute-wide effort designed to reinfuse U.S. industrial production with leading-edge technologies, ignite creation of high-quality jobs, and create a next generation of manufacturing entrepreneurs and leaders. Combining advanced research, innovative education programs, and partnership with companies across many sectors, INM aims to shape a more productive and sustainable future for manufacturing.

“MIT is uniquely positioned to harness the transformative power of digital tools and AI to shape the future of manufacturing. I’m truly excited about what we can build together and the synergies this creates with other cross-cutting initiatives across the Institute,” said MIT Provost Anantha Chandrakasan at the time of the announcement.

Class of 1922 Professor and MechE Department Head John Hart is one of INM’s faculty co-directors. “Manufactured products enable our daily lives, and manufacturing is critical to advancing the frontiers of technology and society,” said Hart. “Our efforts leading up to the launch of the initiative revealed great excitement about manufacturing across MIT, especially from students. Working with industry — from small to large companies, and from young startups to industrial giants — is instrumental to creating impact and realizing a shared vision for new manufacturing.”

Hart is joined by Suzanne Berger, Institute Professor at MIT and a political scientist who has conducted influential studies of manufacturing, Chris Love, the Raymond A. and Helen E. St. Laurent Professor of Chemical Engineering, and Yanchong (Karen) Zheng, the George M. Bunker Professor of Management and an Associate Professor of Operations Management. MechE Principal Research Scientist John Liu serves as INM’s director of education and workforce development.

INM sits alongside MIT’s other presidential initiatives — including The Climate Project at MIT; MITHIC, which supports the convergence disciplines toward human-centered action; MIT HEALS, centered on the life sciences and health; and MGAIC, the MIT Generative AI Impact Consortium.

“We want to reimagine manufacturing technologies and systems to advance fields like energy production, health care, computing, transportation, consumer products, and more,” wrote President Sally Kornbluth. “And we want to reach well beyond the shop floor to tackle challenges like how to make supply chains more resilient, and how to inform public policy to foster a broad, healthy manufacturing ecosystem that can drive decades of innovation and growth.” 

Professor John Hart speaks with Roland Busch, CEO of Siemens, at an INM event. Credit: Tony Pulsone



BEYOND THE PITCH: THE FOUNDER'S JOURNEY

New MechE course explores entrepreneurship through lessons and stories shared by MIT alumni startup founders

By Anne Wilson



Course Instructor Ken Zolot with student Nada Aiouche '25. Credit: John Freidah

The path to launching and growing a startup can be full of twists and turns. For a budding entrepreneur, gaining perspective from those who have already experienced the journey can be incredibly valuable, and highly inspirational.

At MIT, opportunities to explore and learn about entrepreneurship abound. “Looking at the landscape of entrepreneurship offerings, [MIT has] turned up the volume significantly,” says Ken Zolot, senior lecturer at MIT, citing programs like *delta v* (an educational accelerator for MIT student entrepreneurs) and *The Engine* (a nonprofit incubator and accelerator).

2.S977/2.S979 (Founder’s Journey: Launching and Scaling Hardware Startups) explored real-life challenges of startups focused on building and scaling

hardware technologies. The class, which was particularly popular among graduate students, invited students to “find and activate their entrepreneurial energy” through the lens of challenges faced by founders and their teams at various stages in development of new hardware-focused companies — ranging from fundraising to supply chain development and much more.

“There are so many amazing entrepreneurial stories among our alumni. We want to bring those stories to our students and our community and build networks with our incredible alumni founders,” says John Hart SM ’02 PhD ’06, Class of 1922 Professor and MechE Department Head. “Through the Founder’s Journey class and other new programs, we want to cultivate interest

in entrepreneurship among our students and expand opportunities to bring MechE-born technologies to the world.”

According to a 2015 report on MIT’s global entrepreneurial impact, there are more than 30,000 active companies worldwide founded by MIT alumni which employ some 4.6 million people. Marina Hatsopoulos SM ’93, founding CEO of Z Corporation, an early market leader in 3D printing, said one of the aims of the course was to show students they don’t need to reinvent everything. “So much of this has been done before. I want them to understand that this is a well-trod path.”

Each week of the class was structured around a key challenge faced during the development and growth of a hardware startup, presented by the instructors and a guest speaker. The speakers were founders of companies in robotics, energy, 3D printing, consumer products, and other frontier technologies.



iRobot co-founders Helen Greiner SB ’89, SM ’90 and Colin Angle SB ’89, SM ’90 and team members at iRobot Corporation’s IPO ceremony at the NASDAQ MarketSite. Credit: Courtesy of iRobot



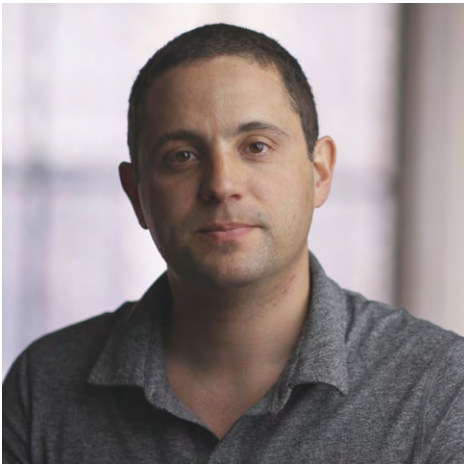
**Colin Angle '89, SM '91,
Co-Founder of iRobot**

Colin Angle '89, SM '91, Co-Founder and former CEO of iRobot, now CEO and Co-Founder of Familiar Machines & Magic, identified a passion for building things early on.

“This idea that you can create something from nothing, that you can have an idea and not just draw it, but build it and make it real is something I’ve always loved,” he says. “MIT had such a strong, hands-on ethos and, that really, powerfully resonated.”

While living in the Alpha Delta Phi Fraternity house at MIT, Angle watched several companies get their start (by his count, five multimillion-dollar companies were started by his fraternity brothers during his time in the house). Seeing others do it helped to demystify the process.

He started iRobot in his living room, beginning at first not with a product concept but a grand vision. “We’re supposed to have robots. So, if not us, who? And if not now, when? It was a magical day.”



Clockwise: Colin Angle, Co-Founder and former CEO, iRobot; Elise Strobach, CEO and Co-Founder, Aeroshield; Maxim Lobovsky, CEO and Co-Founder, FormLabs; Jon Hirschtick, Co-Founder of SolidWorks and Onshape. Courtesy Photos. Credit: John Freidah

The students engaged through preparing questions for the speakers and participating in follow-on discussions and reflective exercises throughout the semester.

Eran Egozy (Harmonix); Renuka Babu (DOTS Technology); Davide Marini (Inkbit); Loewen Cavill (Amira); and Colin Angle (iRobot).

A PackBot used in explosive ordnance disposal training with US and Saudi Arabian forces in 2021. Credit: Courtesy of iRobot

Zolot and Hatsopoulous co-led the class and developed it along with Hart. Hart was among the alumni speakers and spoke to the class about his experience as a co-founder of VulcanForms which began through collaboration between Hart and fellow co-founder Martin Feldmann MEng '14.

The other alumni speakers included Mick Mountz (Kiva/Amazon); Jon Hirschtick (Solidworks/Onshape); Max Lobovsky (Formlabs); Elise Strobach (Aeroshield); Greg Mark (Markforged); Seemantini Nadkarni (Coalesenz);





A window is assembled at AeroShield's manufacturing facility in Waltham. Credit: John Freidah

iRobot may be best known for the Roomba, an autonomous robotic vacuum cleaner, but through the years the company also sent robots to Afghanistan (saving thousands of lives with the Pack Bot tactical mobile robot) and explored the Great Pyramid in Giza live on National Geographic.

“The joy I have taken from my entrepreneurial journey has been the ability to build bigger things, from building teams, to building a company capable of building something far beyond what I could have ever imagined doing myself... we created inventions that no one thought possible simply because we believed we could.”

Elise Strobach SM '17, PhD '20, CEO and Co-Founder of AeroShield

Elise Strobach SM '17, PhD '20, is CEO and Co-Founder of AeroShield Materials. The company, cofounded with Kyle Wilke PhD '19 and Aaron Baskerville-Bridges SM, MBA '20, develops super-insulating transparent window inserts with technology based on transparent silica aerogels developed by Strobach while she was completing her PhD in Professor Evelyn Wang's lab.

“I wasn't thinking of myself as an entrepreneur at that time, but looking back, that's definitely where that seed was planted,” says Strobach. As entrepreneurs, she says, “We have the... freedom to find the best problem to solve and to continue to seek the best way to solve that problem.”

Aerogels, which were first invented almost 100 years ago and were first commercialized by NASA to insulate equipment in space, had a hazy blue tint which limited their use in certain applications. The aerogel material created

by Strobach and her team is completely see-through, creating a variety of new everyday applications. The company recently achieved another milestone, with their work on display at the Smithsonian National Air and Space Museum in Washington, DC.

“You don't have to know everything to start. You just have to know that this is what you want to do, and just get started.”

Maxim Lobovsky SM '11, CEO and Co-Founder of FormLabs

Maxim Lobovsky SM '11 was already working on 3D printers when he came to MIT to study at the MIT Media Lab. As he was finishing his master's degree, he saw an opportunity to build something new.

Lobovsky, with fellow Media Lab graduates David Cranor SM '11 and Natan Linder SM '11, founded Formlabs, a developer and manufacturer of 3D printing technology. The trio set out to build a professional level 3D printer, but a significant cost reduction and one that would be easier to use than what was then available on the market. At the



A Formlabs 3-D printer, which uses Stereolithography. Credit: Courtesy of FormLabs

time, 3D printers could cost \$100,000 or more, Formlabs' product started around \$3,000.

"We definitely built Formlabs in a classic, disruptive innovation path," Lobovsky says. They achieved the cost reduction through several different ways, including replacing technology developed in the 1980s with modern consumer electronics components like the laser diodes that were developed for Blu ray disc players, and with "just a lot of clever engineering."

It was a long grind to raise the first round of funding, he says. The team participated in MIT's 100K competition

Square. The pitch to the initial investor didn't go well but Mitch Kapur, the founder of Lotus Software and an early pioneer in the PC industry overheard the conversation and he ended up leading Formlabs first round of funding.

Today, Formlabs is the largest supplier of professional stereolithography (SLA) and selective laser sintering (SLS) 3D printers in the world.

Jon Hirschtick '83, SM '83, Co-Founder of SolidWorks and Onshape


Jon Hirschtick '83, SM '83, Co-Founder of SolidWorks and Onshape, says the first time he can remember thinking

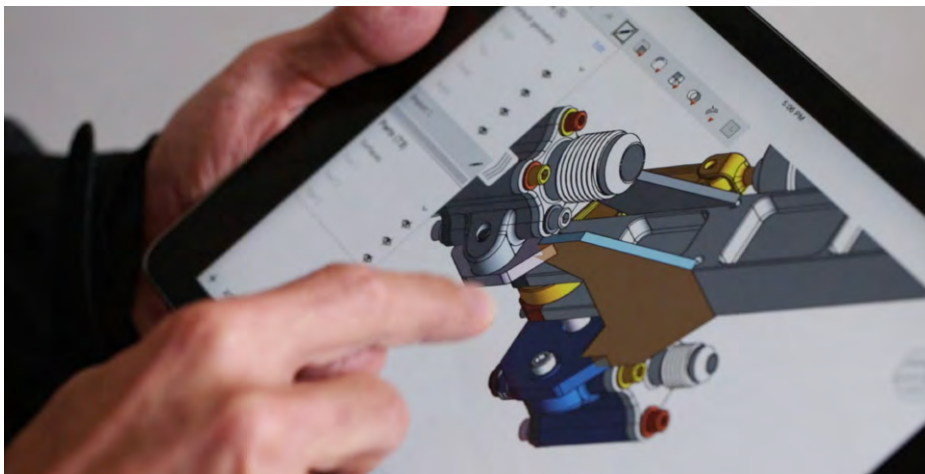
"I thought, 'hey, the world could use this software.' It'll be a better place with the software that I envisioned."

He refers to CAD as a meta product design. "We're designing a product that other people use to design products and that's just really cool to me."

"I think startups just fit me," he says. "The excitement, the idea of trying to solve a lot of problems at the same time. MIT is a place of problem solving... and a startup is a place where there's lots of problems to solve." He adds that a lot of big companies are doing new things, but "startups are always doing things."

He says most anything today that is a manufactured product is modeled in CAD first. "If you're interested and excited by product development, then building a CAD system lets you get involved in the world's product development."

"Nobody knows for sure when they start a company whether it's going to be successful or not. If it were, if there was a way of knowing for sure, then there wouldn't be all these classes in entrepreneurship. They'd just tell you the secret. There's always risk. Visions and hallucinations, they look and feel the same. You only find out which is which once you really try to realize them." 



CAD software in use developed by Onshape. Credit: Courtesy of Onshape

and pitched their idea to many potential investors (with limited success, initially). Their big break came in the form of an overheard conversation.

"As someone who is naturally, introverted, shy engineer...a really important lesson [was] that, sometimes, you can get lucky," he says. "Sometimes talking loudly at a restaurant is actually a good way to get things going."

Lobovsky and one of his cofounders were having dinner with a potential investor at Legal Seafoods in Harvard

about starting a company was when he was an undergraduate.

"I had heard about startups, and it sounded like a lot of things that I was drawn to... a sense of being able to realize your vision, express yourself, a sense of excitement, of making money, and even the idea of a chaotic environment," he says.

Hirschtick has spent over four decades building computer-aided design (CAD) software, starting as an intern at MIT in 1981 and continuing that work today.



Video Feature:
The Founder's
Journey.



More at
youtube.com/@MITMechE

Shreya Agarwal '24 and Malia Smith '24

Graduate students Shreya Agarwal '24 and Malia Smith '24 bring 2.009 prototype to market

By Anne Wilson

Reusable water bottles offer a host of benefits, both environmentally and for the user. Regular use can reduce plastic waste and cut the carbon footprint of manufacturing and disposal, save users money compared to buying single-use bottles, encourage healthier hydration habits, and potentially lessen exposure to chemicals that are present in some plastics. Unfortunately, there are hazards, too, mainly that reusable bottles can be a breeding ground for bacteria, biofilms, and mold, which can lead to quality concerns or health issues.

One team of students in the Fall 2023 cohort of 2.009 (Product Engineering

Processes) saw the problem and set out to solve it. Now, three team members, Shreya Agarwal '24, Malia Smith '24, and Valeria Gutierrez '24 have taken their team's product, Nami, to market. Nami Cleans Co. is "an on-the-go water bottle cleaning solution." Agarwal is CEO, Smith is COO, and Gutierrez serves as Head of Product. Agarwal and Smith are both current graduate students in Mechanical Engineering.

"2.009 had a huge impact on our product and company; it is where we built the first prototype and gave us great proof of concept that the vision can work – and the prototype still works today almost 2 years

later," says Smith. "The experience gave us confidence as we delivered a finished functional prototype in 8 weeks (obviously with the help of the incredible class & Pappalardo staff) and that reminds us that we can do hard things and push the boundaries of what we think is possible."

2.009 is designed to emulate what engineers might experience as part of a design team at a modern product development firm. Working with mentors, teams of students are challenged to conceptualize a new product to solve a practical problem, design and build a prototype, undertake detailed technical analysis, and deliver a final "launch"



Shreya Agarwal '24, Malia Smith '24, left Credit: Tony Pulsone

“We believe deeply in the problem we are trying to solve, and in the value we can bring to people’s everyday lives.”

– Shreya Agarwal '24

presentation introducing their product. According to Smith, Agarwal came up with the original idea, then the team ran with it after considering their own experiences and realizing there was no easy way to clean their reusable bottles.

“We still have people who saw our 2.009 final presentation and come up to say they remember us and want to see the product out in the real world, which is very validating,” Smith says, but adds that the company’s vision is bigger than the one prototype: it’s about solving a clear hygiene problem through a convenient solution.

“We are motivated by being able to solve a real problem for real people... that’s really what motivates us every day,” she says. Agarwal adds, “We believe deeply in the problem we are trying to solve, and in the value we can bring to people’s everyday lives.”

Smith, Agarwal, and Gutierrez participated in the MIT delta v summer accelerator this past summer, a program run by the Martin Trust Center. Selected teams work on their companies, receive funding, and work mentors and instructors in a rigorous structure designed to advance early-stage ventures. According to recent research, at least eight startups with roots in MechE have participated in delta v.

“For me, one of the biggest shifts during the program was learning how to move between an engineering mindset and an entrepreneurial mindset,” says Agarwal. “As engineers, we are taught to collect all the information first and then act, making sure we have answers before we talk to anyone. Delta v forced us to do the opposite. We had to talk to customers and users before we were ready, communicate clearly even when things felt unfinished, and listen carefully to shape direction. That process guided our thinking around go to market, pricing, business model, and more.”

The delta v model includes regular meetings with a mock board of directors. The Nami team worked with a hand-picked

[The Nami original prototype from 2.009.](#)
Credit: Courtesy of Malia Smith



board of individuals with deep experience in hardware, consumer products, and entrepreneurship. Agarwal said the experience taught them how to handle a room of experts, synthesize opinions, take criticism, and defend their decisions. She says the feedback was direct and invaluable, and it pushed them to operate at a higher level.

“Seeing alumni founders who were once in our exact shoes now running successful companies made me believe this is something we can actually execute,” she says. “It made the entire path feel real and achievable. At the end of the summer, I walked away with a lot more conviction in what we are building and that we are the right team to do it.”

Smith is pursuing a master’s in mechanical engineering and works in the MIT Sports Lab, where her research focuses on biomechanics and data analytics. She is also interested in more general sports research, design and manufacturing, and sustainability, and seeks to integrate her enthusiasm for engineering, community impact, and sustainable innovation across her work. Agarwal is also pursuing a master’s in mechanical engineering, focusing on technologies that make carbon capture more efficient and commercially viable. She is motivated by applying engineering to real-world problems in energy, sustainability, and daily life.

“None of us really intended to become entrepreneurs,” Smith says, “but working on something we are excited about every day and getting to create our own path forward has validated that we are in the right place.”

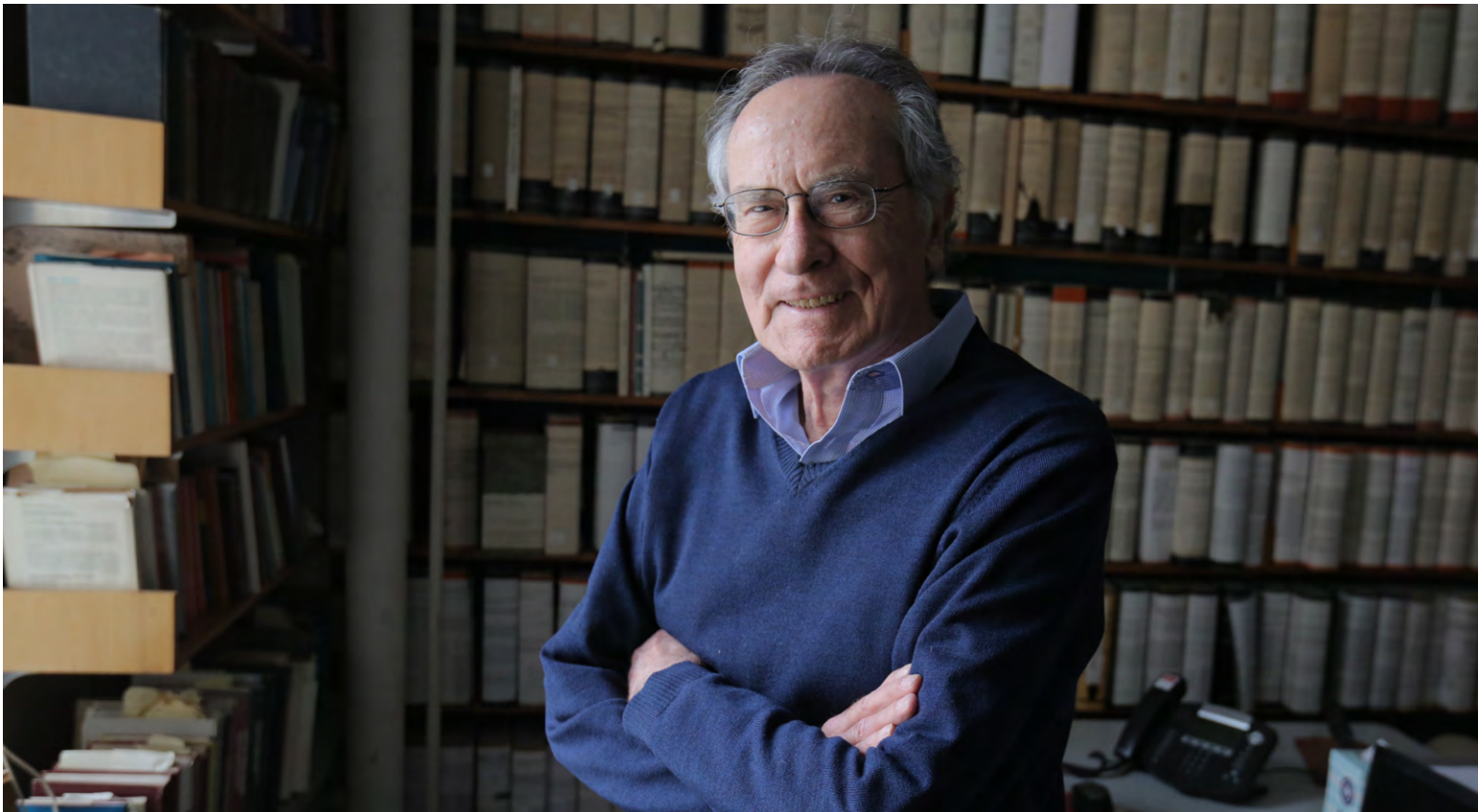
Nami Cleans, Co., is now designing the next version of the product and is preparing for their first paid installations.



Remembering a Pioneer

Professor Ioannis “Yanni” V. Yannas SM ’59, known for the invention of artificial skin, passed away in October 2025 at the age of 90

By Anne Wilson



Ioannis Yannas. Credit: John Freidah

In 1969, when Professor Ioannis V. Yannas SM ’59 approached the late John Burke of Massachusetts General Hospital to collaborate, Burke took him on a tour of a children’s burn unit. “There was a great deal of human misery that was confronting me, and I felt I had to do something about it,” said Yannas in later interviews. In 1981, the pair announced their success: an amalgam of a silicone outer sheet over a scaffolding of molecular material drawn from cow tendon and shark cartilage. Offering protection from infection and dehydration, the scaffolding enabled

healthy skin cells to grow. Their discovery would be transformative for the treatment of burn victims.

Their artificial skin, patented and now manufactured as Integra, is still widely used on patients with severe and extensive burns, and for other applications including some types of plastic surgery and the treatment of chronic skin wounds commonly suffered by people with diabetes. The groundbreaking advance, which was later recognized as the first example of organ regeneration in

adults, had previously been considered impossible.

“He was a model for us all, but especially those of us in the bioengineering sphere,” said Roger Kamm, Professor of Mechanical Engineering and Biological Engineering.

Yannas, who was known to friends and colleagues as Yanni, passed away in October 2025 at the age of 90. His research on induced organ regeneration used to replace organs that are either

severely injured or terminally diseased had an immense impact on the field of bioengineering. His work also advanced the clinical use of collagen tubes to treat peripheral nerve injuries.

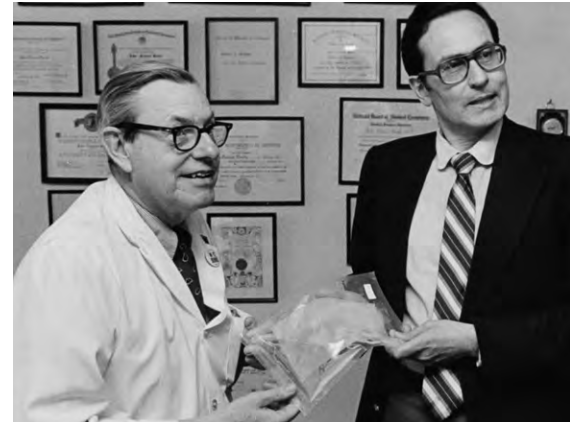
“Yanni’s boldness in attacking a wide array of medical problems, including spinal cord transection, in his investigations of applications of collagen-based implants, inspired others, including myself, to work toward solutions to devastating conditions such as blindness, stroke, and spinal cord injury,” says Myron Spector, professor emeritus of orthopedic surgery (biomaterials) at Massachusetts General Brigham and Harvard Medical School, and an affiliate of the Harvard-MIT Program in Health Sciences and Technology. Yannas and Spector created several MIT courses together, including 2.79 (Biomaterial-Tissue Interactions).

“As we were talking about the content [for 2.79], Yanni proposed that we codify the cell behavior underlying the tissue response to implants,” explains Spector. “Within a short time, we laid out the plan for ‘unit cell processes’ to offer students a code to decipher the often inconceivably complex cellular processes that not only

underlie the tissue response to implants, but that can guide the selection of the tools necessary to engineer medical devices and reveal their targets for treatment. This was all Yanni, taking a fundamental concept, the control volume used in chemical engineering to analyze systems, and applying it to cellular processes in the human body. I since use UCPs myself all the time.”


As a colleague serving as a collaborator in teaching and in research, Spector says Yannas was eager to help and to learn, bold in his thinking, smart in his choices, able to keep his eye on the goal, respectful of students as well as faculty and other colleagues, and selfless. “These are just the traits that we teach our students to look for when seeking the collaborators who are so necessary in science and engineering.”

For his discoveries in organ regeneration, Yannas was elected member of the National Academy of Medicine (1987), the National Inventors Hall of Fame (2015), and the National Academy of Engineering (2017). He was an author of numerous journal articles, the sole author of the influential book, “Tissue and Organ



Surgeon John Burke and chemistry and Ioannis Yannas who together developed the first commercially successful artificial skin. Credit: Courtesy of Massachusetts General Hospital, Archives and Special Collections

Regeneration in Adults,” and he was elected Fellow of the American Institute of Medical and Biomedical Engineering. Further, he was the recipient of many prestigious awards including the Society for Biomaterials Founders Award (1982) and the Society’s Clemson Award for Applied Science and Engineering (1992).

MechE honored Prof. Yannas’ memory by establishing the annual Ioannis V. Yannas Memorial Lecture in Bioengineering. The inaugural lecture was delivered by Brendan Harley SM ’02 ScD ’06, Robert W. Schaefer Professor at the University of Illinois. Harley was a graduate student in Yannas’ lab. 



Artificial Skin. Credit: John Freidah



Video Feature: Yannas’ work, and 2015 induction into the National Inventors Hall of Fame, was the subject of “Hope Regenerated.” The film chronicles the development of Integra, a life-saving discovery that launched a new field of regenerative medicine.



Bolstering Maine's Blue Economy

A chemical-free approach to carbon removal protects marine life, could have huge global aquaculture market impacts

By Anne Wilson



Oyster farmers work from a floating barge in Maine's Damariscotta River Estuary. Credit: Aditya Mehrotra

Oceans absorb roughly 25 to 30 percent of the carbon dioxide (CO₂) that is released into the atmosphere. When this CO₂ dissolves in seawater, it forms carbonic acid, making the water more acidic and altering its chemistry. Elevated levels of acidity are harmful to marine life like corals, oysters, and certain plankton that rely on calcium carbonate to build shells and skeletons.

“As the oceans absorb more CO₂, the chemistry shifts – increasing bicarbonate while reducing carbonate ion availability– which means shellfish have less carbonate to form shells,” explains Kripa Varanasi, professor of mechanical engineering at MIT. “These changes can propagate through marine ecosystems, affecting organism health and, over time, broader food webs.”

Loss of shellfish can lead to water quality decline, coastal erosion, and other ecosystem disruptions, including significant economic consequences for coastal communities. “The U.S. has such an extensive coastline, and shellfish aquaculture is globally valued at roughly \$60 billion says Varanasi. “With the right innovations, there is a substantial opportunity to expand domestic production.”

“One might think ‘this [depletion] could happen in 100 years or something,’ but what we’re finding is that they are already affecting hatcheries and coastal systems today,” he adds. “Without intervention, these trends could significantly alter marine ecosystems and the coastal economies that rely on them over time”

Varanasi and T. Alan Hatton, the Ralph Landau Professor of Chemical Engineering, Post-Tenure, at MIT have been collaborating for years to develop methods for removing carbon dioxide from seawater and turn acidic water back to alkaline. In recent years, they’ve partnered with researchers at the University of Maine Darling Marine Center to deploy the method in hatcheries.

“The way we farm oysters, we spawn them in special tanks and rear them through about a two-week larval period... until they’re big enough so that they can be transferred out into the river as the water warms up,” explains Bill Mook, founder of Mook Sea Farm. Around 2009, he noticed problems with production of early-stage larvae. “It was a catastrophe. We lost several hundred thousand dollars’ worth of production,” he says.

Ultimately, the problem was identified as the low pH of the water that was being brought in: The water was too acidic. The farm's initial strategy, a common practice in oyster farming, was to buffer the water by adding sodium bicarbonate. The new approach avoids the use of chemicals or minerals.

"A lot of researchers are studying direct air capture, but very few are working in the ocean capture space," explains Hatton. "Our approach is to use electricity, in an electrochemical manner, rather than add chemicals to manipulate the solution pH."

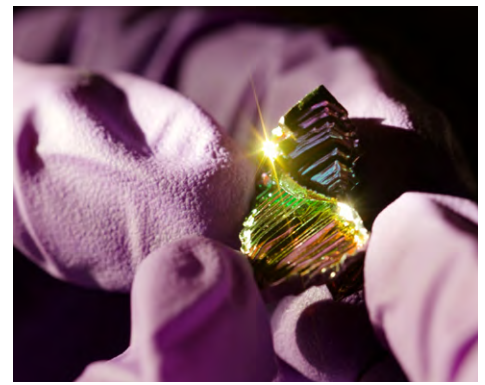
The method uses reactive electrodes to release protons into seawater that is collected and fed into the cells, driving the release of the dissolved carbon dioxide from the water. The cyclic process acidifies the water to convert dissolved inorganic bicarbonates to molecular carbon dioxide, which is collected as a gas under vacuum. The water is then fed to a second set of cells with a reversed voltage to recover the protons and turn the acidic water back to alkaline before releasing it back to the sea.

"The scientific underpinning of our hypothesis was that these bivalve shellfish, including oysters, need calcium carbonate in order to form their shells," says Simon Rufer PhD '25, a former student in Varanasi's lab and now CEO and co-founder of CoFlo Medical. "By alkalizing the water, we actually make it easier for the oysters to form and maintain their shells"

In trials conducted by the team, results first showed that the approach is biocompatible and doesn't kill the larvae and later showed that the oysters treated by MIT's buffer approach did better than mineral or chemical approaches. Importantly, Hatton also notes, the process creates no waste products. Ocean water goes in, CO₂ comes out. This captured CO₂ can potentially be used for other applications, including to grow algae to be used as food for shellfish.

Varanasi and Hatton first introduced their approach in 2023. Their most recent paper, "Thermodynamics of Electrochemical Marine Inorganic Carbon Removal," which was published last year in journal *Environmental Science & Technology*, outlines the overall thermodynamics of the process and presents a design tool to compare different carbon removal processes. The team received a "plus-up award" from ARPA-E to collaborate with University of Maine and further develop and scale the technology for application in aquaculture environments.

Damian Brady, a professor of oceanography based at the University of Maine and key collaborator on the project, says the project represents another avenue for aquaculture to contribute to climate change mitigation and adaptation. "It pushes a new technology for removing carbon dioxide from ocean environments forward simultaneously," says Brady. "If they can be coupled, aquaculture and




A piece of bismuth used in the electrochemical process. Credit: John Freidah

carbon dioxide removal improve each other's bottom line."

Through the collaboration, the team is improving the robustness of the cells and learning about their function in real ocean environments. The project aims to scale up the technology and to have significant impact on climate and the environment, but it includes another big focus.

"It's also about jobs," says Varanasi. "It's about supporting the local economy and coastal communities who rely on aquaculture for their livelihood. We could usher in a whole new resilient blue economy. We think that this is only the beginning. What we have developed can really be scaled."

Mook says the work is very much an applied science, "[and] because it's applied science, it means that we benefit hugely from being connected and plugged into academic institutions that are doing research very relevant to our livelihoods. Without science, we don't have a prayer of continuing this industry." 



Video Feature:
Saving Maine's
Oysters



Oyster farmers harvest and sort oysters grown on the Damariscotta River Estuary in Maine. Credit: John Freidah

Burning things to make things

Associate Professor Sili Deng is driving research into sustainable and efficient combustion technologies

By Anne Wilson



Postdoc David Keisar (right) discusses his research in battery deactivation and energy system analysis with Associate Professor Sili Deng. Credit: John Freidah

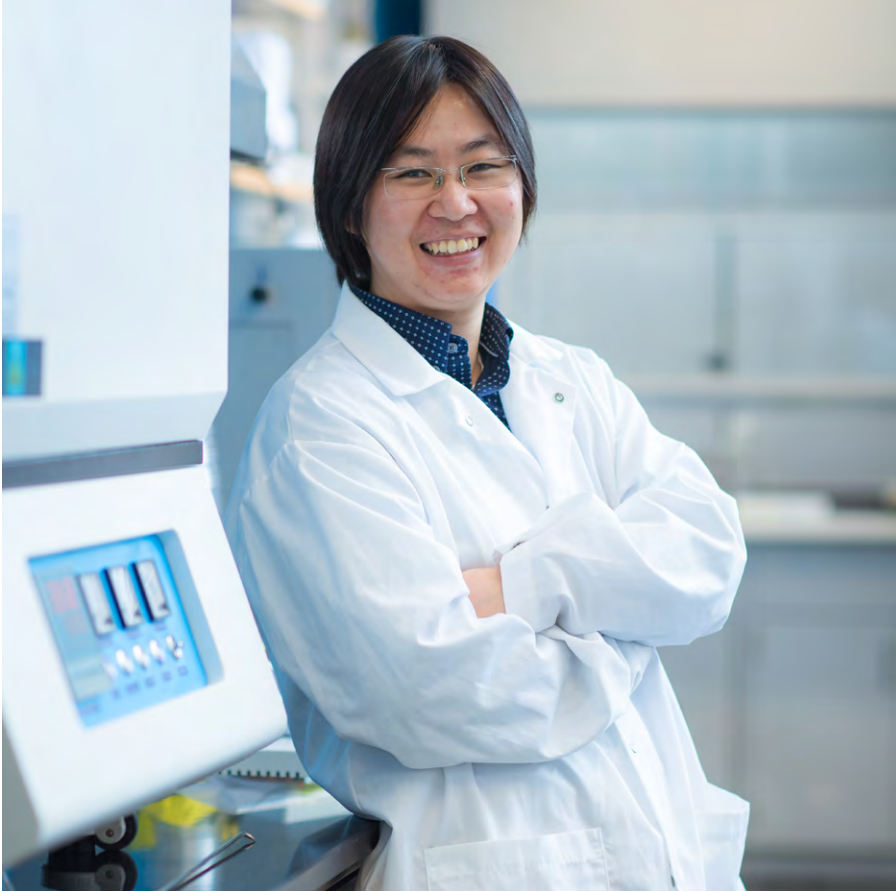
Around eighty percent of global energy production today comes from the combustion of fossil fuels. Combustion, or the process of converting stored chemical energy into thermal energy through burning, is vital for a variety of common activities including electricity generation, transportation, and domestic uses like heating and cooking – but it also yields a host of environmental consequences, contributing to air pollution and greenhouse gas emissions.

Sili Deng, Doherty Chair in Ocean Utilization Professor in Ocean Utilization and associate professor of mechanical engineering, is leading research to drive the transition from the heavy dependence on fossil fuels to renewable energy with storage.

“I was first introduced to flame synthesis in my junior year in college,” Deng says. “I realized you can actually burn things to make things [and] that was really fascinating.”

Deng says she ultimately picked combustion as a focus of her work because she likes the intellectual challenge the concept offers. “In combustion you have chemistry, and you have fluid mechanics. Each subject is very rich in science. This also has very strong engineering implications and applications.”

Deng’s research group targets three areas: building up fundamental knowledge on combustion processes and emissions; developing alternative fuels and metal




Sili Deng. Credit: Gretchen Ertl

combustion to replace fossil fuels; and flame-based synthesis of materials for catalysis and energy storage, which can bring down the cost of manufacturing battery materials.

One focus of the team has been on low-cost low-emission manufacturing of cathode materials for lithium-ion batteries. Lithium-ion batteries play an

increasingly critical role in transportation electrification (e.g., batteries for electric vehicles) and grid energy storage for electricity that is generated from renewable energy sources like wind and solar. Deng's team has developed a technology they call Flame-Assisted Spray Pyrolysis, or FASP, which can help reduce the high manufacturing costs associated with cathode materials.

FASP is based on flame synthesis, a technology that dates back nearly 3,000 years. In ancient China, this was the primary way black ink materials were made. “[People burned] vegetables or woods, such that afterwards they can collect the solidified smoke,” Deng explains. “For our battery applications, we can try to fit in the same formula but of course with new tweaks.” The team is also interested in developing alternative fuels, including looking at the use of metals like aluminum to power rockets. “We’re interested in utilizing aluminum as a fuel for civil applications,” Deng says, because aluminum is abundant in the earth, cheap, and it’s available globally. “What we are trying to do is to understand [aluminum combustion] and be able to tailor its ignition and propagation properties.”

Among other accolades, Deng is a 2025 recipient of the Hiroshi Tsuji Early Career Researcher Award from the Combustion Institute, an award that recognizes excellence in fundamental or applied combustion science research. 

Graduate Research Assistant Hyein Choi studies dominant mechanisms during self-propagating high-temperature synthesis in the Deng Energy and Nanotechnology Group. Credit: John Freidah



Video Feature: Learn more about Professor Sili Deng's work.



2.155/156: AI and Machine Learning for Engineering Design

Popular mechanical engineering course applies machine learning and AI theory to real world engineering design

By Anne Wilson

AI and machine learning offer a host of benefits for mechanical engineers, including faster and more accurate designs and simulations, improved efficiency, reduced development costs through process automation, and enhanced predictive maintenance and quality control.

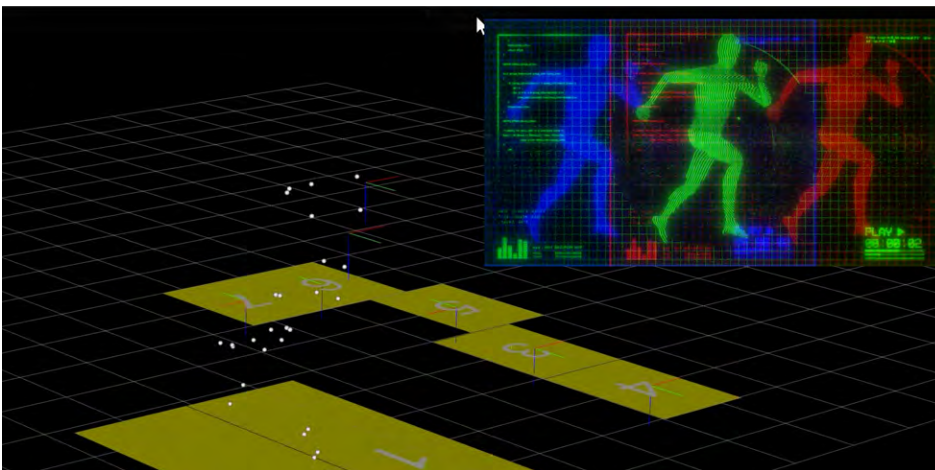
“When people think about mechanical engineering, they’re thinking about basic mechanical tools like hammers and... hardware like cars, robots, cranes, but mechanical engineering is very broad,” says Faez Ahmed, Doherty Chair in Ocean Utilization and associate professor

of mechanical engineering. “Within mechanical engineering, machine learning, AI, and optimization are playing a big role.”

In Ahmed’s course, 2.155/156 (AI and Machine Learning for Engineering Design), students use tools and techniques from Artificial Intelligence and Machine Learning for mechanical engineering design, focusing on the creation of new products and addressing engineering design challenges.

“There’s a lot of reason for mechanical engineers to think about machine learning and AI to essentially expedite the design process,” says Lyle Regenwetter, a recent PhD graduate and former teaching assistant for the course. Regenwetter conducted his PhD work in Ahmed’s Design Computation and Digital Engineering Lab (DeCoDE), where research focuses on developing new machine learning and optimization methods to study complex engineering design problems.

First offered in 2021, the class has quickly become one of MechE’s most popular elective offerings, attracting students from departments across the Institute, including mechanical and civil and environmental engineering, aeronautics and astronautics, the Sloan School of Management, and nuclear and computer science, along with cross-registered students from Harvard and other schools.



“Markered Motion Captured Data” from a final project, which looked at predicting ground force for runners. Credit: Courtesy of researchers



Students taking 2.155 (Artificial Intelligence and Machine Learning for Engineering Design) work on a homework set in which they analyze incomplete bike images and predict what parts are missing. Credit: Courtesy of researchers



2.155 students prepare to introduce their initial ideas for potential final class projects. Credit: Lauren Futami

The course, which is open to both undergraduate and graduate students, focuses on the implementation of advanced machine learning and optimization strategies in the context of real-world mechanical design problems. From designing bike frames to city grids, students participate in contests related to AI for physical systems and tackle optimization challenges in a class environment fueled by friendly competition.

Students are given challenge problems and starter code that “gave a solution, but [not] the best solution...” explains Ilan Moyer, who took the course as a PhD

student. “Our task was to [determine], how can we do better?” Live leaderboards encourage students to continually refine their methods.

Em Lauber, a System Design and Management (SDM) graduate student, says the process gave space to explore the application of what students were learning and the practice skill of “literally how to code it.”

The curriculum incorporates discussions on research papers, and students also pursue hands-on exercises in machine learning tailored to specific engineering issues including robotics, aircraft, structures, and metamaterials. For their final project, students work together on a team project that employs AI techniques for design on a complex problem of their choice.

Lauber took the framework of a “cat tree” design with different modules of poles, platforms and ramps to create customized solutions for individual cat households, while Moyer created software that is designing a new type of 3D printer architecture.

“It is wonderful to see the diverse breadth and high quality of class projects,” says Ahmed. “Student projects from this course often lead to research publications and have even led to awards.” He cites the example of a recent paper, titled “GenCAD-Self-Repairing,” that went on to win the American Society of Mechanical Engineers (ASME) Systems Engineering, Information and Knowledge Management (SEIKM) 2025 Best Paper Award.

“When you see machine learning in popular culture, it’s very abstracted, and you have the sense that there’s something very complicated going on,” says Moyer. “This class has opened the curtains.”



Faez Ahmed, instructor for 2.155/156, is the Doherty Chair in Ocean Utilization and associate professor of mechanical engineering. Credit: Lauren Futami



Video Feature: Teaching AI and ML for Engineering Design – From Cat Trees to 3D Printers



News & Awards

Departmental News

Topping the lists

US News ranked MechE first among undergraduate and graduate programs. QS World University Rankings placed MIT first in mechanical engineering for 2025-26 (among 11 top-ranked subject areas) and named MIT the top university for the 14th year in a row.

Faculty Promotions

Effective July 1, 2025:

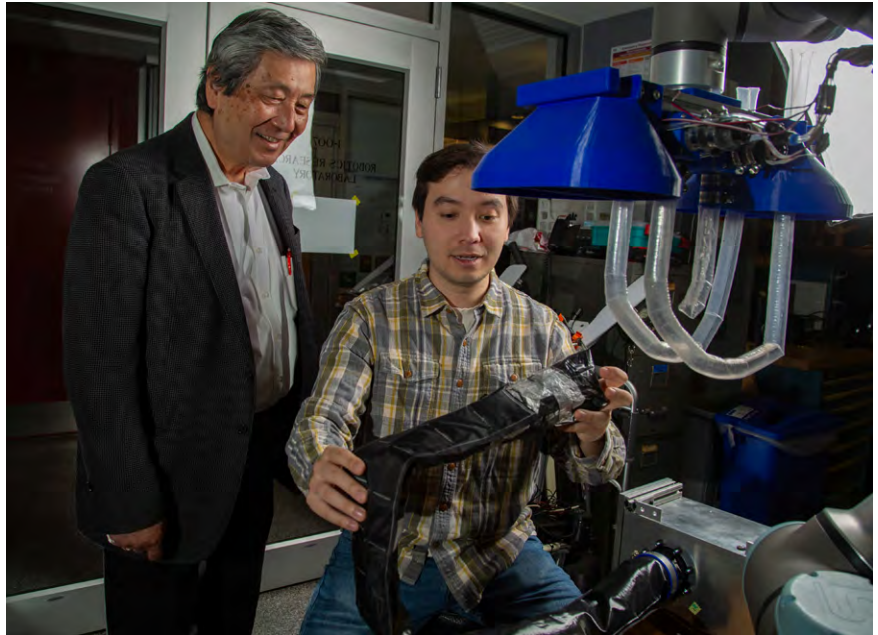
- Ellen Roche to Full Professor
- Faez Ahmed to Associate Professor
- Carlos Portela to Associate Professor
- Vivishek Sudhir to Associate Professor

Effective July 1, 2026:

- Betar Gallant to Full Professor
- Ming Guo to Full Professor
- Giovanni Traverso to Full Professor
- Navid Azizan to Associate Professor



Ellen Roche. Credit: Jodi Hilton



Harry Asada, left, and Kentaro Barhydt inspect their vine robot. Credit: Tony Pulsone

- Ritu Raman to Associate Professor
- Sili Deng to Associate Professor
- Wim Van Rees to Associate Professor

Professors of the Practice

- David Barrett appointed Professor of the Practice
- Chris Wiernicki appointed Professor of the Practice

Research Highlights

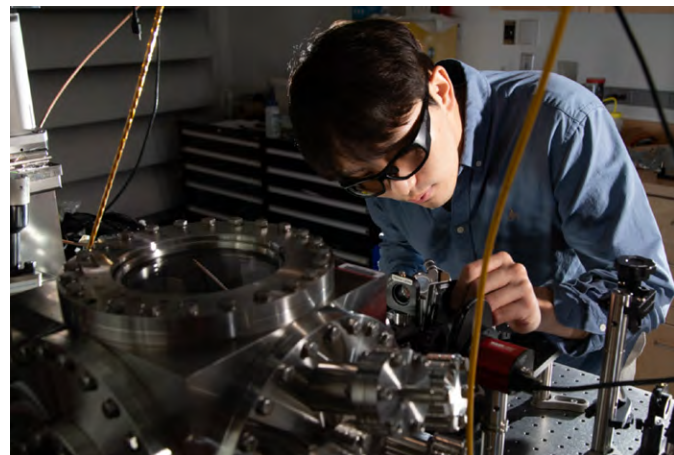
A team in Assistant Professor Ming Guo's lab has developed a way to predict how individual cells will fold, divide, and rearrange during a fruit fly's earliest stage of growth which may help predict the development of more complex tissues, organs, and organisms. (Journal: *Nature Methods*)

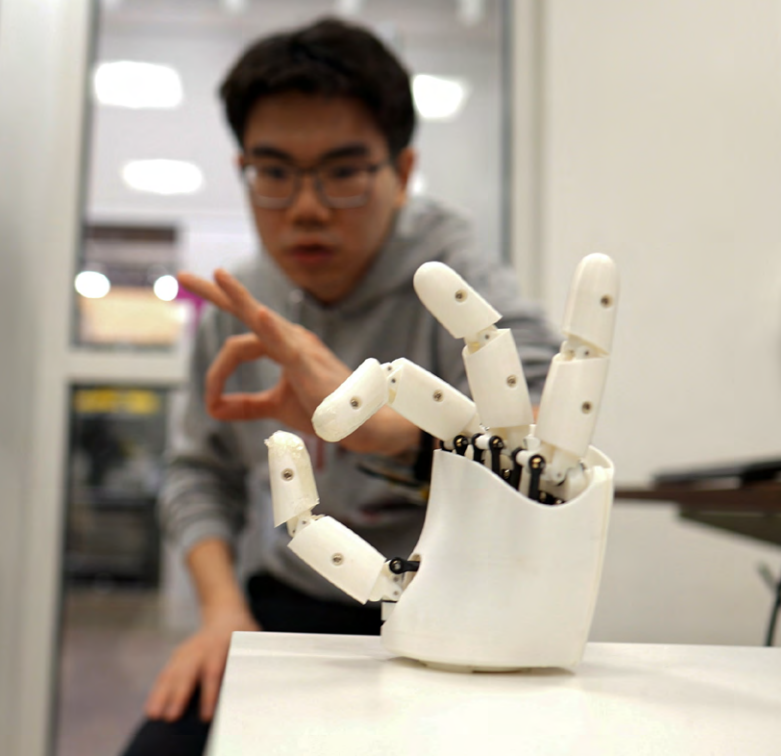
Dongchel Shin, a PhD candidate in mechanical engineering and the lead author of a new paper that demonstrates laser cooling of a centimeter-long torsional oscillator, works on an optical setup. Credit: Tony Pulsone

Inspired by vines, researchers in Professor Harry Asada's lab developed a robotic gripper that can snake around and lift a variety of objects. (Journal: *Science Advances*)

Principal Research Scientist Svetlana Boriskina and colleagues introduced an ultrasonic device that dramatically speeds harvesting of water from the air. (Journal: *Nature Communications*)

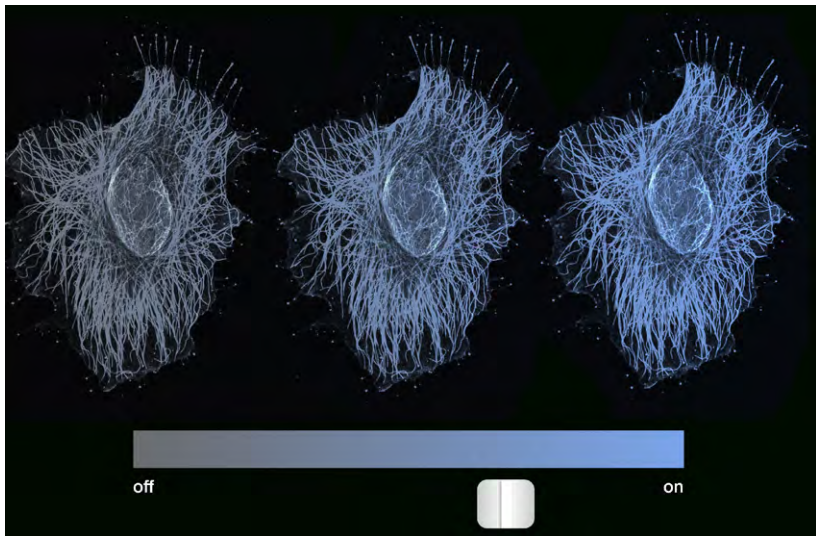
A technique developed by researchers in Associate Professor Vivishek Sudhir's lab enables a new class of experiments that could let physicists test whether gravity needs to be described by quantum theory. (Journal: *Optica*)





Graduate student Dian Li working with a robotic hand. Wristband enables wearers to control a robotic hand with their own movements. Credit: Melanie Gonick

Traditionally, scientists have thought that epigenetic memory locks genes either “on” or “off” — either fully activated or fully repressed. But MIT engineers have found that a cell’s memory is set not only by on/off switching but also through a more graded, dimmer-like dial of gene expression. Credit: Illustration by Christine Daniloff, MIT; NIH



A research team from MIT and Carnegie Mellon University, including Professor John Hart, has developed a printable aluminum alloy that can withstand high temperatures and is five times stronger than traditionally manufactured aluminum. (Journal: *Advanced Materials*)

A team in Professor Xuanhe Zhao’s lab has designed an ultrasound wristband that enables wearers to control a robotic hand with their own movements. (Journal: *Nature Electronics*)

Researchers in Associate Professor Giovanni Traverso’s lab have designed a pill that can report when it has been swallowed, which could help ensure people take medication on schedule. (Journal: *Nature Communications*)

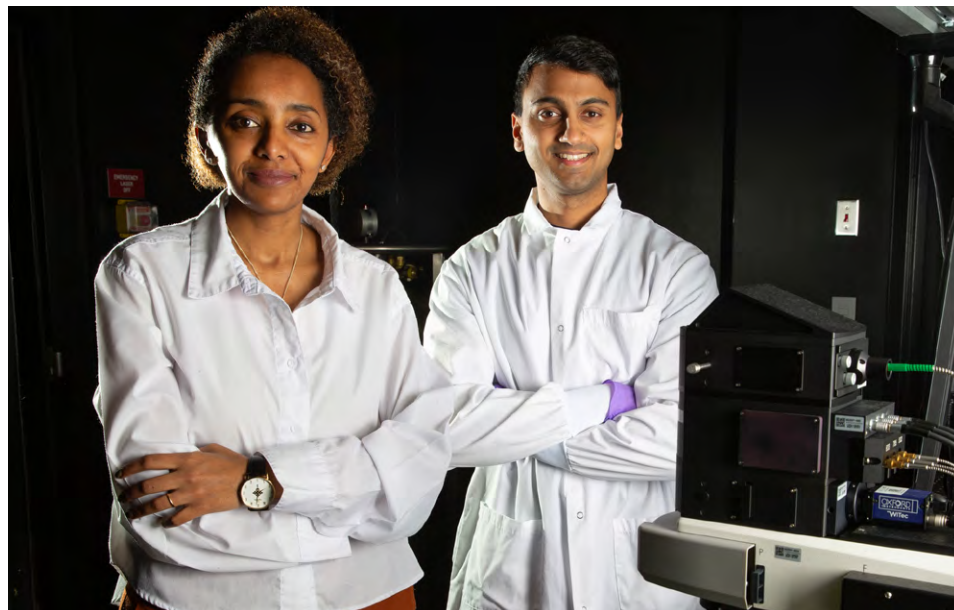
A team in Professor Domitilla Del Vecchio’s lab reports that a cell’s memory is set not by on/off switching but through a more graded, dimmer-like dial. (Journal: *Cell Genomics*)

Assistant Professor Loza Tadesse and her group have developed a new sensor that can sniff out pneumonia on a patient’s breath. (Journal: *Nano Letters*)

A first-of-its-kind handbook developed by the MIT Maritime Consortium serves as a guide for design safety for civilian nuclear ships.

Plants can sense the sound of rain before the water reaches them, according to research by Professor Nicholas Makris, in the first direct evidence that seeds can sense sounds in nature. (Journal: *Scientific Reports*)

Engineers working with Professor David Hardt in the MIT Laboratory for Manufacturing and Productivity are using recycled plastic to 3D print construction-grade beams and other structural elements. (Published: *Solid FreeForm Fabrication Symposium Proceedings*)



Loza Tadesse, left, and Aditya Garg. The Tadesse Group looked to design a sensitive, portable breath test. Credit: Tony Pulsone



Rivian Founder and CEO RJ Scaringe SM '07 PhD '09

Alumni News

Founded by **Aron Blaesi** PhD '14 and former principal research scientist **Nannaji Saka** ScD '74, Enzian Pharmaceuticals is developing an oral tablet that delivers drugs into gastric fluid and blood steadily over time.

U.S. Secretary of Energy **Chris Wright** '85 paid a visit to campus to meet Institute leaders, discuss energy innovation at a campus forum, and view poster

Found, with support from the Department of Energy, is hoping to use their electrochemical gallium extraction technology to create a new domestic supply chain for gallium and a host of other important metals. Credit: Courtesy of Found Industries

presentations from researchers supported through the MIT-GE Vernova Energy and Climate Alliance.

Leaders for Global Operations featured **Doug Field** SM '92, Ford's chief of EVs and digital design, who led a clean-sheet design of Ford's electric vehicle platform.

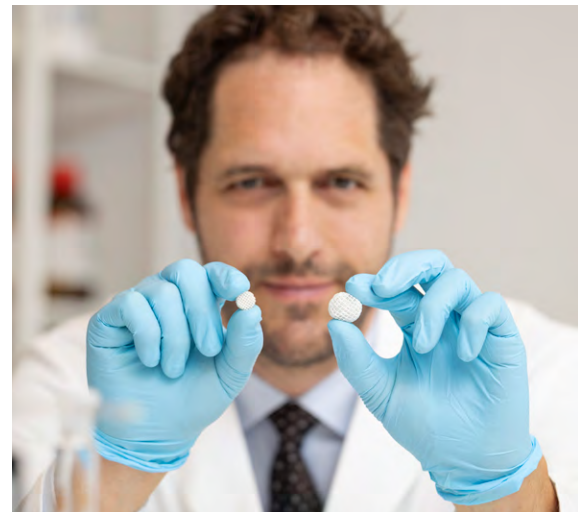
Rivian Founder and CEO **RJ Scaringe** SM '07 PhD '09 announced production of the company's R2 model.

Faculty Award Highlights

Professor **John Lienhard** was inducted to the National Academy of Engineering (NAE) class of 2026 for advances and technological innovations in desalination, and to the American Society of Mechanical Engineers.

Professor **Evelyn Wang** was elected to the National Academy of Engineering in 2025 for outstanding contributions to engineering.

Professor **Gareth McKinley** was elected to National Academy of Sciences (NAS) for distinguished and continuing



Aron Blaesi PhD '14 holds two gastroretentive fibrous dosage forms. Credit: Photo courtesy of Enzian Pharmaceuticals

achievements in original research, and to the American Academy of Arts and Sciences in recognition of his pioneering work in the rheology of complex fluids, non-Newtonian fluid dynamics, and micro rheology.

Professor **Ellen Roche** and Assistant Professor **Ritu Raman** received the Presidential Early Career Award for Scientists



and Engineers (PECASE), the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers.

Associate Professor **Giovanni Traverso** was named a Foreign Corresponding Member of the Royal Academy of Medicine of Belgium.

Professors **Xuanhe Zhao** (Class of 2025) and **Ellen Roche** (Class of 2026) were elected to the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows.

Department and Institute Awards, Faculty

- **Faez Ahmed**, Joseph H. Keenan Award for Innovation in Undergraduate Education
- **Kaitlyn Becker**, Ruth and Joel Spira Award for Excellence in Teaching
- **Barbara Hughey**, MIT Teaching with Digital Technology Award
- **Carlos Portela**, MIT Junior Bose Award (highest teaching award given annually to a junior faculty member in the School of Engineering)

- **Loza Tadesse** and **Ellen Roche**, Committed to Caring
- **Amos Winter**, MIT Bose Award, MacVicar Faculty Fellow

External Awards, Faculty


- **Faez Ahmed**, NSF Career Award, Amazon Research Award
- **Navid Azizan** and **Vivishek Sudhir**, NSF Early Career Development (CAREER) Award
- **Kait Becker**, IEEE Robosoft Rising Star
- **Gang Chen**, Alexander von Humboldt Award; Foreign member, Chinese Academy of Science
- **Sili Deng**, US Early Career Combustion Investigator Award; Nanoscale Emerging Investigator; Hiroshi Tsuji Early Career Researcher Award
- **Betar Gallant**, ACS Energy & Fuels Rising Star
- **Yang Shao-Horn**, 2025 Now La Maison Innovation Award, David C. Grahame Award
- **Carlos Portela**, 2025 Extreme Mechanics Letters Young Investigator Award, NAS Kavli Frontiers of Science Fellow
- **Ritu Raman**, NAE Grainger Foundation Frontiers of Engineering, BMES CMBE



Gareth McKinley. Credit: John Freidah

- Rising Star Junior Faculty Award; Biomaterials Science Emerging Investigator; Bioengineering and Translational Medicine Early Career Innovator
- **Ellen Roche**, Sony Women in Technology Awards with Nature
- **Michael Triantafyllou**, ASME Fluids Engineering Division Award and Plenary Lecture
- **David Trumper**, ASPE Lifetime Achievement Award
- **Kamal Youcef-Toumi**, Elected Member of Algerian Academy of Science and Technology
- **Xuanhe Zhao**, James R. Rice Medal, Society of Engineering Science

Department and Institute Awards, Staff

- **John Mayo**, **Anne Wilson**, and **Saana McDaniel** each received a School of Engineering Infinite Mile Award.
- **Lisa Maxwell** and **Daniel Shea** received The Joseph (Tiny) Caloggero Service Award.
- **Abbey Simmers** received The H. Sharon Trohon Award.
- **Steve Banzaert** received the Mechanical Engineering Exceptional Educator Award for Teaching Staff. 



John Lienhard. Credit: Tony Pulsone



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New Program Trains Naval Officers for the AI Age

The new Applied Artificial Intelligence Program for Naval Officers, offered jointly by the Departments of Mechanical Engineering and Electrical Engineering and Computer Science, will prepare naval officers to master the fundamentals of artificial intelligence and apply them to mission-relevant challenges. More at 2n6.mit.edu.



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