

# TECH



*Caltech  
Alumni  
Magazine  
Fall 2024*

## WEAR WE'RE HEADED

Fashioning the future of wearables

## THE PIONEERS

Reflections from Caltech's first four-year female graduates

## SMOKE SIGNALS

A watchful eye on wildfires

**Caltech** Alumni



# 2024

## TABLE OF CONTENTS

"When we're developing new technologies, we are always looking at how they may be deployed in an environmentally friendly manner in every environment. We're making sure all the applicants for funding address those issues in their applications."

PAGE 20

"We're not trying to replace the current methodology; we're just trying to enhance it because clearly there's still a problem."

PAGE 6

## 05 TRANSFORMING

### 06 | BURN NOTICE

Wildfires are on the rise across the globe and curbing them will be a team effort. Gilberto DeSalvo and his company, Delphire, are joining the battle.

### 10 | FASHION FORWARD

For Daniel Mukasa, the future of wearables requires sweating the small stuff.

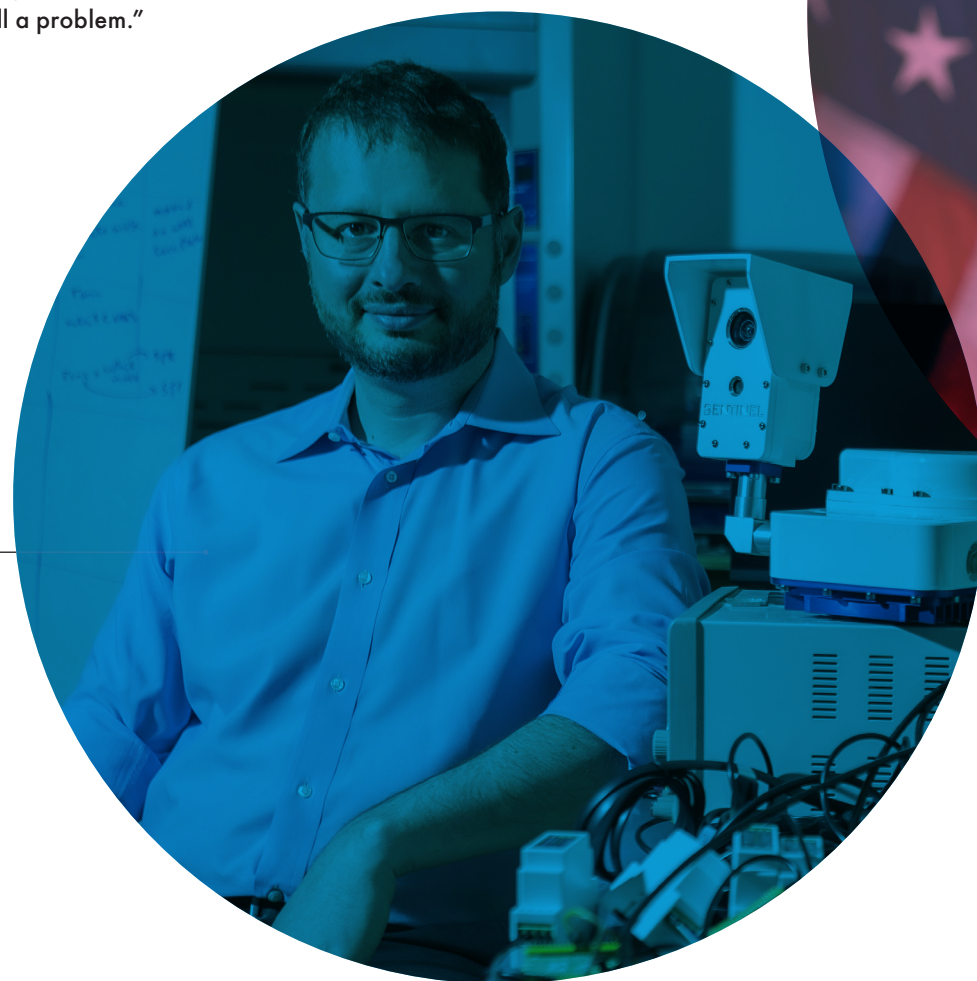
## 13 PIONEERING

### 14 | THE PIONEERS

On the 50<sup>th</sup> anniversary of their graduation, the first four-year female graduates reflect on their time on campus—and where they went from here.

### 20 | ALL IN

The key to a more sustainable future? Make sure everyone can join the hunt for solutions, says National Energy Technology Laboratory director Marianne Walck.







## 23 ENRICHING

### 24 | **MOTHER NURTURE**

How Maneesh Jain and Mirvie are modernizing maternal health

### 28 | **BREAKING NEWS**

AI, deepfakes, and misinformation are already complicating the political landscape. How can the American public navigate this election season?

### 32 | **MEET THE NEW LEADER OF ALUMNI ENGAGEMENT**

Mario Peraza on his vision and plans for the future

### 34 | **IN MEMORIAM**



"We definitely don't have all the treatments [in maternal health] that we do in oncology. We know that pregnancy health is probably two to three decades behind fields like oncology, but hopefully we can leapfrog and catch up pretty quickly."

PAGE 24

(All In) Courtesy of Marianne Walck;  
(Mother Nurture) Photo by Mitch Tobias





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Jeremy Arnold is a freelance writer and copyeditor whose work has appeared in *Variety*, *The Hollywood Reporter*, and *Moviemaker*. He has written four books on classic film for Turner Classic Movies and Running Press, with his latest, a newly expanded edition of *Christmas in the Movies*, published last year. Jeremy appears periodically on TCM as a guest presenter and programmer, and has recorded audio commentaries for the Blu-ray release of nearly two dozen classic films.



### JULIETTE BORDA

Ever since NYC-based illustrator Juliette Borda attended an ERA march when she was 11, she's been an advocate for equal rights. So working on projects about pioneering women (especially those working to promote diversity and gender equality in their field) has been a special thrill for Juliette throughout her decades-long career. Her work blends traditional painting on paper (in gouache, a water-based paint medium) with digital enhancement.



### MARISA DEMERS

Marisa Demers is a freelance writer who got her start covering wildfires and breaking news for newspapers. She also worked for Caltech and was most recently an assistant director for the Caltech Associates. A San Gabriel Valley native, she has enjoyed following Caltech's scientific breakthroughs and student pranks over the years.



### AMANDA FRIEDMAN

Amanda Friedman is originally from suburban Detroit. She currently lives in Los Angeles and shoots for a variety of different clients including Apple, American Express, *The Hollywood Reporter*, *Entertainment Weekly*, *Billboard* and *People*. Her photos have been published in the *American Photography* 15, 17 and 18 annuals. She was a 1999 *Surface Magazine* Avant Guardian and a 2008 Critical Mass Finalist. To view more of her work, check out [amandafriedman.com](http://amandafriedman.com).



# TECHER

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COVER: Daniel Mukasa, MS (MS '21)  
Photograph by Amanda Friedman



# TRANSMISSION

*From the Board Chair of the Caltech Alumni Association*



JENNIFER LEE, PhD (PhD '10)  
*Board Chair,  
Caltech Alumni Association*

As my two-year term as Chair of the Caltech Alumni Association's Board of Directors comes to a close, I wanted to share some of my reflections over this time and also my thoughts on the future of the organization.

We have evolved as an organization and community over these past two years. As we entered the post-pandemic environment, the Board of Directors made strategic investments to recharge alumni connections with each other and with Caltech through online programming, in-person engagement, and hybrid opportunities. This is no easy feat, considering that we have 26,000+ alumni around the world. These investments were essentially experiments, informed by our alumni community who engaged and provided feedback to inform how we could create more meaningful moments. Our experiments were well worth it—from July 1, 2023, to June 30, 2024, we have engaged 2,153 alumni, which is a tremendous achievement. With some refinement, we are poised to keep this momentum going.

I am pleased that with the Board's support and the CAA team's vision and expertise, we were able to launch our Caltech In... regional events, resulting in seven events around the United States. We also brought our Tables for Techers initiative to life, earning a Gold Winner in the Collegiate Advertising Awards, recognizing our staff's marketing strategy and campaign. More than 600 alumni gathered together at Tables for Techers held around the world. The smiles, stories, and friendships brought by these new traditions (it's tradition if we do it two years in a row!), demonstrate the impact that the CAA has on all of us. Marquee events such as Caltech In... regional gatherings, Tables for Techers, Alumni Weekend and Reunion, and Seminar Day, as well as those connective events of Senior Dinners (for our very soon-to-be alumni) to the Half Century Celebrations (for our alumni who graduated 50+ years ago), highlight the diversity of our alumni community and provide multiple touchpoints for engagement.

The Board has also sought to redefine when students begin their

journey to become alumni, starting when students arrive on campus. Over the past year, we have developed relationships with our campus partners and allocated collaborative resources so that we can connect students with alumni as soon as they start at Caltech. This will allow alumni to volunteer as mentors and share the value of the Caltech network as students approach their next adventure post-Caltech. We will be launching some new programs in the upcoming year, so please stay tuned.

All of these programs and more were possible due to the amazing team of professionals we have in the CAA and the support by the Advancement and Alumni Relations team, who made things seamless over the past year while we held our search for the new CEO of the CAA. Finally, I am pleased that Mario Peraza, our new CEO at the CAA and AVP of Alumni Relations, will be our lead partner going forward to continue unlocking the value of what it means to be an alumnus/alumna of Caltech. As you may know, the CAA Board provides strategic direction and relies upon its collaborative relationship with Caltech and the CAA team to bring our events and platforms to life. I am excited for the CAA Board to continue the positive, forward-looking relationship in the years to come so that we can continue to enjoy our connections with each other and Caltech as we continue to grow individually and as a community, and share what it means to be a Techer.

A handwritten signature in black ink, appearing to be 'J Lee'.

JENNIFER LEE, PhD (PhD '10)  
*Board Chair, Caltech Alumni Association*





# TRANSFORMING

## Binding Lights

IN A RECENT RESEARCH PAPER, assistant professor Alireza Marandi delves into the innovative realm of mode-locked lasers. These lasers emit light in pulses, providing unparalleled precision and power compared to continuous beams. Marandi's team enhances these lasers with topological robustness, creating a pattern of pulses that can resist disruptions from noise or imperfections. By "tying knots" in laser pulses, Marandi is pioneering a method to stabilize laser behavior, which can be employed in eye surgery as well as various communication, sensing, and computing applications.

IMAGE: ALIREZA MARANDI

# BURN NOTICE

**WILDFIRES ARE ON THE RISE ACROSS THE GLOBE AND CURBING THEM WILL BE A TEAM EFFORT AMONG ORGANIZATIONS AND TECHNOLOGY. GILBERTO DESALVO AND HIS COMPANY, DELPHIRE, ARE JOINING THE BATTLE.**

**BY MARISA DEMERS/PHOTOGRAPHY BY LEAH LEE**







**“WHO ELSE CAN WE PARTNER  
WITH TO HAVE AN IMPACT?  
WHO CAN WE WORK WITH?  
THAT’S ULTIMATELY WHAT  
NEEDS TO BE DONE TO  
TACKLE FIRE. THIS IS NOT  
A ONE-COMPANY OR  
ONE-PERSON EFFORT.”**

**WHEN GILBERTO DESALVO, PHD (PHD '18) WAS AT CALTECH,** studying biology and using machine learning to help sort through the vast data from his automated lab experiments, his apartment caught fire. It was an electrical issue in the unit below him, and he had to stand by and watch as his belongings burned and succumbed to smoke damage. Having had the experience of needing to evacuate and being displaced, DeSalvo wanted to help others who may face the same fate.

Unfortunately, that population is growing, with the intensity and frequency of wildfires increasing around the world. One recent study from the University of Maryland found that wildfires are burning nearly twice as much tree cover today as they did 20 years ago.

His solution to this growing threat was Delphire, a company he founded in 2020, and its signature product: the Sentinel FD3, a device loaded with dual cameras boasting infrared technology, GPS, and smoke sensors to locate fires in their earliest stages. The Sentinel is fueled by an onboard AI, allowing it to collect, analyze, and share data rapidly when needed to lower the risk of devastation to communities. The device also collects information that can assist first-responders, utility companies, forest management officials, and federal, state, and local agencies who are making decisions around planning, and—when needed—evacuation and firefighting.

Here, DeSalvo talks about the technology, his unique customer base, and his hope to make a difference with his company.

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Before bringing situational awareness to help those fighting fires, you earned your PhD in biology and focused on machine learning. What led you from lab experiments to combating the wildfires through AI?

**Gilberto DeSalvo:** During COVID, everything was covered in smoke from the 2020 fires here in Pasadena, and it seemed like a good time to do something about it. So I studied the problem and saw how the electrical grid was the potential cause of some of the more devastating fires in recent memory due to failing or downed wires. At Delphire, we're not tackling deep forest fires, which really only amount to about 5% of fires. There are other technologies that are better suited for that work. So I decided to focus on the problem that I saw, tackling fires inside utility rights-of-way and near communities, so we created a product that would

give communities and first-responders earlier detection, and help utilities and local agencies model risk.

Your signature product, the Sentinel, looks like a camera, which is a common tool in wildfire detection, but this is much more than that. Explain the technology.

**GD:** It's been a bit of a struggle to explain our product, because whenever you talk about wildfire detection, everybody naturally thinks about a camera on a mountaintop. We're trying to rewrite what that looks like by bringing the AI component directly inside our device to detect flame and smoke.

We're also harnessing additional data that can be useful for predictions and modeling. Infrared imagery gives us an idea of where a fire



might be spreading by seeing through smoke. Smoke and chemical sensors detect where the smoke is localized. There are also weather sensors built into the unit so we can see wind speed and direction.

It's more than just an image of smoke in the hills of California—it's a collection of data that's sent to us from units near power lines, critical assets, infrastructure, and people. So the point here is to offer data and provide wider visibility into these particular issues so that everybody has a true understanding of the problem, which will allow organizations and community leaders to make informed decisions.

**You have previously compared the technology to a home security system, but Delphire's market isn't individuals. Who is your customer?**

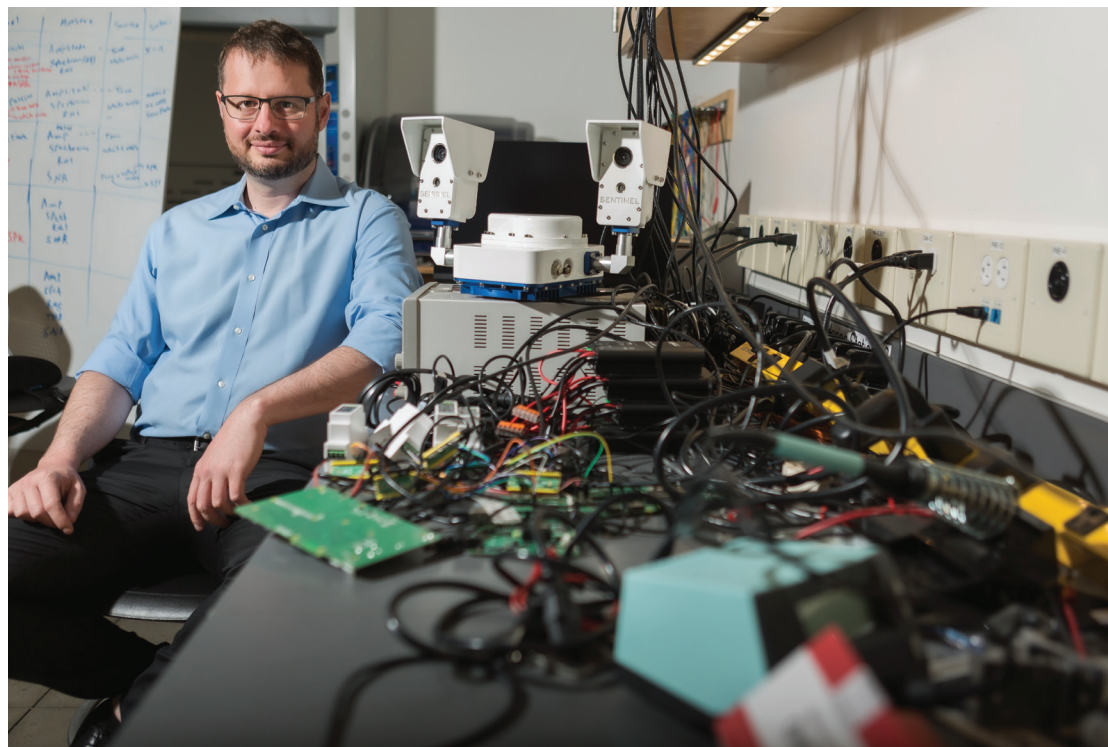
**GD:** The utilities are our core market. We also are looking at communities as a possibility; an HOA might deploy these, for example.

But the camera on the mountaintop is the main technology in use now, and it will continue to be. That said, there are a lot of locations where bringing the infrastructure needed for those cameras would be difficult and expensive—you have to run energy wherever you place those devices. Those are the areas that Delphire is targeting. Our unit isn't much larger than the cameras currently in use, and it's solar-powered, freestanding, and compact. It can be affixed to already-established utility towers or can be self-deployed in harder-to-reach locations. We'll be integrating our cameras into the system so that they work seamlessly with technology already in use and enhance the visibility of some of these areas near communities.

We're not trying to replace the current methodology; we're just trying to enhance it because clearly there's still a problem. If mountaintop cameras were completely sufficient, then we wouldn't have fires grow out of control.

**Where do you hope to go from here?**

**GD:** Delphire, which is currently funded by a Department of Energy Small Business Innovation Research grant, collaborates with organizations like Alert California, Watch Duty, the Lawrence Berkeley National Lab, and the NASA Ames Research Center to help detect actual fires and provide data for risk modeling. We're thinking about it from a big-



picture perspective, not just from a detection standpoint. Who else can we partner with to have an impact? Who can we work with? That's ultimately what needs to be done to tackle fire. This is not a one-company or one-person effort.

We are going to add some additional deployments near communities and utilities so we can have a broader impact in early detection. We're demonstrating this technology throughout California and have expanded to high-risk areas in Colorado. We're also participating in the upcoming XPRIZE competition focused on wildfires. This is an ongoing competition over the course of several years, with the goal of demonstrating rapid detection and autonomous suppression of fires.

Overall, my hope is to see Delphire scale up, to create more partnerships, and to really help people. At the end of the day, that's why I started this company. ■







# FASHION >> FORWARD

**FOR DANIEL MUKASA, THE FUTURE OF WEARABLES  
REQUIRES SWEATING THE SMALL STUFF.**

**BY JEREMY ARNOLD >> PHOTOGRAPHY BY AMANDA FRIEDMAN**

**G**ROWING UP IN RIVERSIDE, CALIFORNIA, **DANIEL**

**MUKASA, MS (MS '21)** FOUND HIMSELF DRAWN

TO BOTH OF HIS PARENTS' VOCATIONS. "MY DAD IS AN

ENGINEER AND MY MOM IS IN HEALTH CARE," MUKASA

SAYS, "SO I KIND OF ENDED UP IN THIS MIDDLE FIELD OF

BIOMEDICAL ENGINEERING. I WANTED TO DO ENGINEERING

BECAUSE I THINK WITH A VERY TECHNICAL MIND, BUT I

WANTED IT TO HELP PEOPLE. WORKING ON BIOMEDICAL

PROBLEMS—WHERE I COULD, SAY, DIAGNOSE A DISEASE

EARLY ON—FELT REALLY EXCITING."

## [ Transforming ]

While completing his undergraduate studies at Oberlin College, Mukasa set his sights on Caltech. “I wanted to come back home, come back to the sun, and do amazing physics while also trying to help people’s lives,” he says. “And I landed in the perfect spot for that.” Specifically, he landed in the innovative lab of Wei Gao, assistant professor of medical engineering, who has been developing wearable sensors that monitor biomarkers in sweat to allow for the detection and management of various diseases and health conditions.

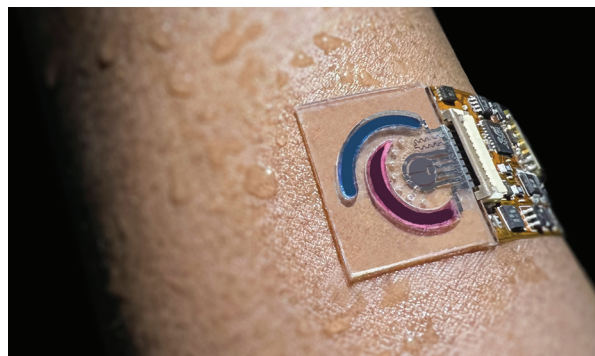
Thanks to the diffusion of molecules from the bloodstream to the sweat duct, explains Mukasa, “almost everything that you find in a blood profile you’ll also find in your sweat profile.” But unlike blood tests, whose results are a snapshot in time, sweat monitoring is non-invasive and offers continuous, real-time data. Each sensor is designed to detect a specific metabolite or nutrient, including amino acids, vitamins, hormones, and proteins.

For example, Mukasa has worked on one device, worn on the forearm, that tracks the amino acid phenylalanine for a rare but serious disease called phenylketonuria. Another monitors glucose levels, which can correlate to diabetes. There are also applications to monitor women’s reproductive cycles. “There’s a company, Oura, that [currently] makes a ring which tells a woman roughly where she is in her cycle, primarily from changes in body temperature—but this isn’t nearly as accurate as what you could get from a device that’s actually tracking the estrogen coming out of you.”

Mukasa says that some people in the lab find a niche, concentrating their efforts on a certain disease. “I’m really interested in all diseases,” says Mukasa, “so I’ve been focused on how to make the chemical sensor as accurate as possible for any biomarker—so that once we know something correlates to a disease, we can just make a device and ship it out immediately.”

The primary hurdle has been that in sweat, biomarkers appear in very low concentrations. Proteins are particularly difficult to detect because when they diffuse from the bloodstream to the sweat duct, they get blocked by tissue or fat cells that might be in the way. “Detecting them for that reason is already hard,” Mukasa says. “Having a device that can continuously detect them over a timespan can be really challenging. It’s a tricky one.”

While honing the sensitivity and accuracy of the sensors remains a



While wearables that can offer cancer detection are still many generations away, Mukasa says it “isn’t necessarily an impossible goal.”



**Read more about how Caltech engineers are developing wearable sensing technologies and materials that could transform the practice of medicine.**

**>> “WE SPENT TWO TO THREE YEARS JUST DETECTING THREE BIOMARKERS...NOW, WITH AI, IF YOU’RE ABLE TO TRAIN THE RIGHT MODEL, IT SCALES THINGS DOWN BY FOUR TO FIVE ORDERS OF MAGNITUDE.”**

difficult task, another challenge has already been significantly mitigated: the time it takes to find the correct materials and chemical procedures to construct each device. The process used to take years, but thanks to AI, which has brought considerable innovation and transformation to the entire field of materials science, the timeline is now often a matter of weeks. “We spent two to three years just detecting three biomarkers,” says Mukasa. “Now, with AI, if you’re able to train the right model, it scales things down by four to five orders of magnitude. We’re almost at the point where we can automate the entire development process, which is really exciting.”

Still many generations away, however, is the major goal of early cancer detection. “This isn’t necessarily an impossible goal,” says Mukasa, “because there have been reports of dogs being able to smell cancer on people—so there is some type of chemical profile change that happens. Maybe we can find the biomarkers for this. It would take more in-depth studies and years of research to find what exact chemical, or chemicals, are needed to make a diagnosis. It’s like needles in a haystack—but when they are found, it will open the doors to the potential of early diagnosis.”

As for his own future, Mukasa plans to pursue a career in academic sciences. “I want to open up my own research lab and continue making these devices and span out as much as I can into the health care field,” he says. “Drug discovery has been particularly interesting to me because you can’t just diagnose the diseases—at a certain point you have to treat them.” ■



## A Legendary Hack Turns 40

IN THIS MOMENT of Caltech mischief that required months of planning, students Ted Williams, PhD (BS '84) and Dan Kegel (BS '86) manipulated the scoreboard during the January 2, 1984, Rose Bowl game between Illinois and UCLA. The acronym "DEI," prominently displayed here, references Dabney Eats It. Earlier messages like "Go CIT" and a matrix image, initially went unnoticed. But the Techers' ambitious plans to rename the event the "1984 Beaver Bowl" were thwarted when the scoreboard abruptly powered down in the final minutes. The prank featured sophisticated remote technology that allowed Williams and Kegel to control the scoreboard from a distant hill—a feat that astonished spectators and confounded Rose Bowl officials.

IMAGE: CALTECH ARCHIVES



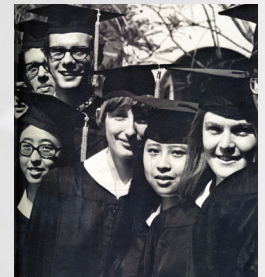
PIONEERING



# THE PIONEERS



**ON THE 50<sup>TH</sup> ANNIVERSARY OF THEIR GRADUATION,  
THE FIRST FOUR-YEAR FEMALE GRADUATES REFLECT  
ON THEIR TIME ON CAMPUS—AND WHERE THEY  
WENT FROM HERE.**



**BY MARISA DEMERS**



**Scan to read more**  
stories and reflections  
from 1974 alumnae

*Girls! After just six weeks on campus, Caltech's inaugural group of coeds is completely involved in university activities. This picture series shows one freshman meeting the astronauts during their visit to the campus and, oh yes, talking with*





**CALTECH'S 1974 COMMENCEMENT** is famous for Richard Feynman's "Cargo Cult Science" address, but another significant event took place that day, the impact of which can still be felt.

Twenty-six of the graduates were Caltech's first freshman class of women to earn bachelor's degrees. To commemorate the moment, Caltech President Harold Brown said, "Our experience demonstrates that given the motivation, and the opportunity, young women can compete equally with young men."

The women sitting on Beckman Lawn that day fought hard for every positive word uttered on the stage. In 1970, a different set of words was said to them by a small but vocal community of skeptics. Fellow students told **RHONDA MACDONALD, MS (BS '74)** that Caltech had lowered its standards to admit women. **LOUISE KIRKBRIDE'S, MS (BS '75, MS '76)** first advisor told her she was a "waste of an education." **MARY EICHBAUER'S, PhD (BS '74)** advisor suggested she drop out, get married, and have children. He told her that as long as there was a man in the country who could benefit from a Caltech education, the Institute should not admit women.

Their response to the critics? Keep studying.

They worked hard in the classroom and the laboratory and became researchers, engineers, and doctors, and also entrepreneurs, children's theater directors, and writers. Thanks to them, the cruel words faded and eventually quieted. Today, 43% of Caltech undergraduates identify as female.

"Some might say that as women, we were trailblazers, but I think we were more like guinea pigs back in the early 1970s," **JOYCE HSIAO, MS (BS '74, MS '77)** says. "Who knows what would have happened if the women in our class had all been so miserable that we all left Caltech and transferred to another school? Fortunately, that did not happen and enough of us were able to graduate so that Caltech could continue to include women as part of their undergraduate program."

In celebration of the 50th anniversary of Caltech's first four-year female graduates, *Techer* interviewed Kirkbride, Eichbauer, Hsiao, and MacDonald about their Caltech experience and how it shaped their lives.

**"THEIR RESPONSE TO THE CRITICS? KEEP STUDYING."**



Photo by Leah Lee

**"It was absolutely the hardest school to get into, which made it irresistible to me."**

## A TEENAGE RUNAWAY FINDS HER PLACE

WHEN Louise Kirkbride landed at Los Angeles International Airport in late summer 1970, she expected to be stopped by the police. Hours earlier, the 17-year-old had packed her belongings and boarded a plane without telling her parents. Once they learned of her plans, Kirkbride's parents called the authorities. "I was just so hell-bent on being a Caltech student that I would have crawled over broken glass to get there," Kirkbride says. "It was absolutely the hardest school to get into, which made it irresistible to me."

The self-described suburban Philadelphia fugitive did not have to face the turmoil alone. She had supporters, which she called Team Louise, and they included President Brown, who called Kirkbride's parents. Other Team Louise members found her a job as a waitress at the Athenaeum and helped her become an emancipated minor.

Once she settled in, Kirkbride discovered that Caltech was challenging and intense. And she loved it.

"Students complain about how hard it is, but that's the point," says Kirkbride, a Caltech trustee for 29 years. "Everything else in your life is going to seem doable after Caltech."

That may be why she moved to Silicon Valley in the early 1980s to launch her own software startup despite having no formal training in software development or business. "I started going around to venture capitalists with my business idea and, honest to god, that's where my Caltech education paid off," says Kirkbride, whose companies modernized the customer service industry. "Once you take Physics 1 with Richard Feynman, nothing scares you. Absolutely nothing."

Kirkbride did not attend the 1974 commencement. Tired from working nearly full-time at the Athenaeum and balancing her studies, she moved to Santa Barbara for a year to work for a Caltech alumnus. She graduated the following year. Most of her memories about commencement are foggy except for one.

Says Kirkbride, "Harold Brown walked up to my parents and I thought, 'Is he going to punch my father?' because it got really nasty for a while. Instead, he reached out and grabbed my father's hand and said, 'I had no idea what you were going through.'"

## FIGHTING THE NOISE

PART OF WHAT THRILLED **Mary Eichbauer** about being accepted to Caltech was the opportunity to be in the first class of female undergraduate students.

The thrill was short-lived. She received persistent and unwelcome attention from men, both faculty and students. One night, drunk male students walked the women's corridor in Blacker House, singing songs about abducting Eichbauer and her housemates. The men turned the doorknobs to each of their rooms. Eichbauer says the men were never punished for their actions.

These harassments, coupled with Caltech's rigorous curriculum and her waning interest in science, took a toll on Eichbauer. She flunked out her sophomore year.

"For a long time, I felt like a failure," Eichbauer says. "I really didn't do what I had set out to do. A lot of women cut through the noise, but I couldn't. I was too affected by it." The Institute quickly reinstated her and, in an act of grit and resilience, Eichbauer retook her sophomore classes while maintaining a full junior course load. She soon regained her academic standing and graduated on time.

She also switched her focus from science to English literature and found a passion for the humanities and

the arts. Some of the leading figures of the day visited Caltech and Eichbauer learned from and met many of them, including Lawrence Durrell, Anaïs Nin, and Frank Capra (BS '18). After graduation, Eichbauer earned a doctorate in comparative literature from UCLA and worked as a university instructor, technical writer, and freelance editor at different times in her life. More recently, she has become a published poet.

The young girl who once collected rocks and dreamed of becoming a geologist still lives inside her, she says. Scientific thinking has shaped her worldview and her poetry is infused with the curiosity and big-picture thinking she learned at Caltech.

"Being the 'first' to do anything is difficult," Eichbauer says. "Collecting the stories of the women who paved the way for others is an essential part of preserving Caltech's history. I'm happy to have the chance to tell my story."

## Student views

# What do Caltech girls think about first year on campus?

By Nick S  
Female undergrads  
of the Caltech scene  
as yet there have been  
disapproval. But what  
of Caltech?  
Laurie Schalit and  
spent their summer



**"Collecting the stories of the women who paved the way for others is an essential part of preserving Caltech's history. I'm happy to have the chance to tell my story."**



MAJOR DEBATE BEGINS

# Can Women Break Caltech Barrier?

BY LEE AUSTIN  
Times Staff Writer

PASADENA—Women are setting off a major debate on the Caltech

serious thought to taking women undergraduates," said Dr. Arnold Beckman, chairman of the Board of Trustees.

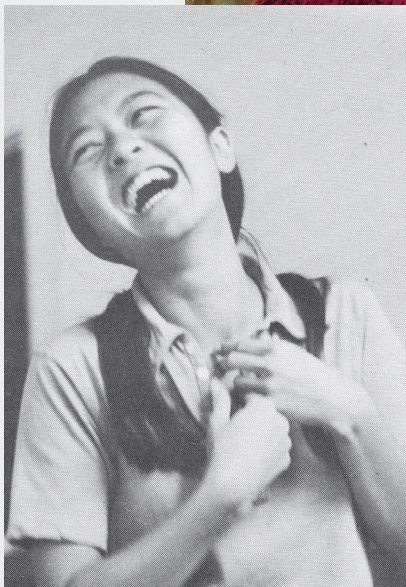
Explaining that "I am not opposed to women as such," Beckman said, before making Caltech used "a great deal of thought must be given to it."

The question of women undergraduates has never come to the administrative level," said Dr. Robert E. Barker, Caltech's

men in undergraduate classes was in 1882 when founder Amos G. Throop opened the doors of the then Throop Polytechnic Institute, forerunner of Caltech, to pupils from the fifth grade to the bachelor's degree levels.

Eighteen years later, the institution was reorganized into a college and Caltech began its long tradition of no women undergraduates with an enrollment of 30 men students.

Although the line has been held on



## FROM LAB COAT TO SCUBA GEAR

WHEN **Joyce Hsiao** left her home in Silver Spring, Maryland, to attend Caltech, the 18-year-old had two goals in mind: figure out how to make the world a better place and explore the California lifestyle. Hsiao's seven years at Caltech—four as an undergraduate, two as a staff member, and one as a graduate student—transformed her life more than she imagined.

Hsiao seemed destined to be a scientist. She had grown up in a family of scientists and engineers. Her mother, Helen Hsiao, was a physical chemist and her father, C.Y. Hsiao (BS '26), was a civil engineer and one of the first Chinese-born students to attend Caltech. Hsiao majored in chemistry but did not want to spend her life working in the laboratory. This realization sent her searching for an alternative career.

"The focus among students was who could solve a problem faster, quicker, and more elegantly, and I found myself drawn to more practical and physical challenges," Hsiao says.

Hsiao found her ideological counterpart in the late marine biologist Wheeler North, PhD (BS '44, BS '50). The ocean was North's laboratory and scuba diving was one of his research tools. He was trying to repopulate kelp beds off the Southern California coast and was recruiting Caltech students. Hsiao, who had just received her bachelor's degree, took a scuba diving class at Caltech and joined him.

**"The focus among students was who could solve a problem faster, quicker, and more elegantly, and I found myself drawn to more practical and physical challenges."**

That experience gave her a lifelong friend in North and an unexpected career. Hsiao returned to Caltech to earn her master's degree in environmental engineering and North served as her advisor. For the next 44 years, Hsiao specialized in water quality projects throughout Northern California.

Yet the greatest gift Caltech gave her was connecting her to student Bob Stanley, whom she met during her first year at Caltech. They remained together after he transferred to UCLA. "Caltech changed my life in all good ways because it led me to not only a fulfilling career but also to my husband," Hsiao says. "We've been married 45 years, have four kids, and I couldn't have asked for anything better."

## FINDING HER TRIBE

GROWING UP IN New Bedford, Massachusetts, there were not a lot of teenagers who were nerdy like **Rhonda MacDonald** but still fun-loving—socially awkward but still social. At Caltech, she fit right in. She formed a close-knit group of male and female friends from Ricketts House, and no one cared about each other's genders. They had fun and pulled pranks, which included making their fellow Skurve's room "disappear" by plastering and painting over his door.

The housemate "eventually found the location of the door, grabbed a tool and started hacking away at the wall," MacDonald says. "Somebody called security because he was vandalizing the house, and they took him away. We just had so much fun with that prank." To this day, MacDonald's group of friends stay in touch, traveling and attending reunions together.

Academically, she thrived in the Division of Engineering and Applied Science. Faculty gave her the freedom to explore and stumble in different disciplines until she found her footing in civil engineering. The division's focus on theory and problem-solving was invaluable to MacDonald after graduation as she switched back and forth between the petrochemical and aerospace industries.

Her greatest champion was the late mechanical engineering professor Rolf Sabersky, PhD (BS '42, MS '43, PhD '49). He had two daughters close in age to MacDonald, and he looked out for her as a father would.

"Dr. Sabersky cared about my entire well-being at Caltech," MacDonald says. "I was invited to his home for Thanksgiving dinner, and when my mother sold her small business due to health issues, he and his family offered me a room at their house. Caltech came through with financial aid, so I never took him up on his offer, but he was always very special to me."

The friendship with Sabersky was so important that her favorite memory of commencement was not hearing her name called or walking across the commencement stage. Instead, she remembers the joy of introducing Sabersky to her family. ■

## First women receive Caltech BS degrees

Change was the keynote of the 79th annual commencement of the California Institute of Technology held June 8 on

bolizing a new frontier in Caltech research.

Marching in the gowned procession of seniors were the first four women in history to receive BS degrees from the Institute.

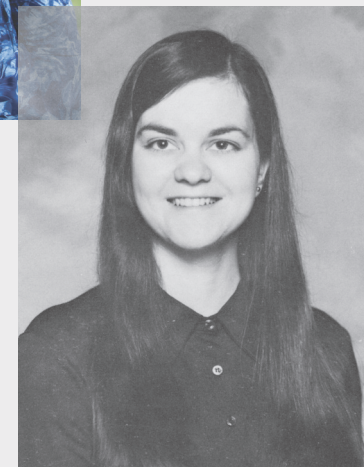
Doctoral candidates were especially honored for the first time in many years by having the titles of their dissertations read (but not explained) as they were awarded their PhD's.

This year there was no commencement speaker.

Arnold O. Beckman, PhD '28, making his ninth and final appearance at commencement exercises as chairman of the board of trustees, cited the changes that have taken place during his 50-year asso-

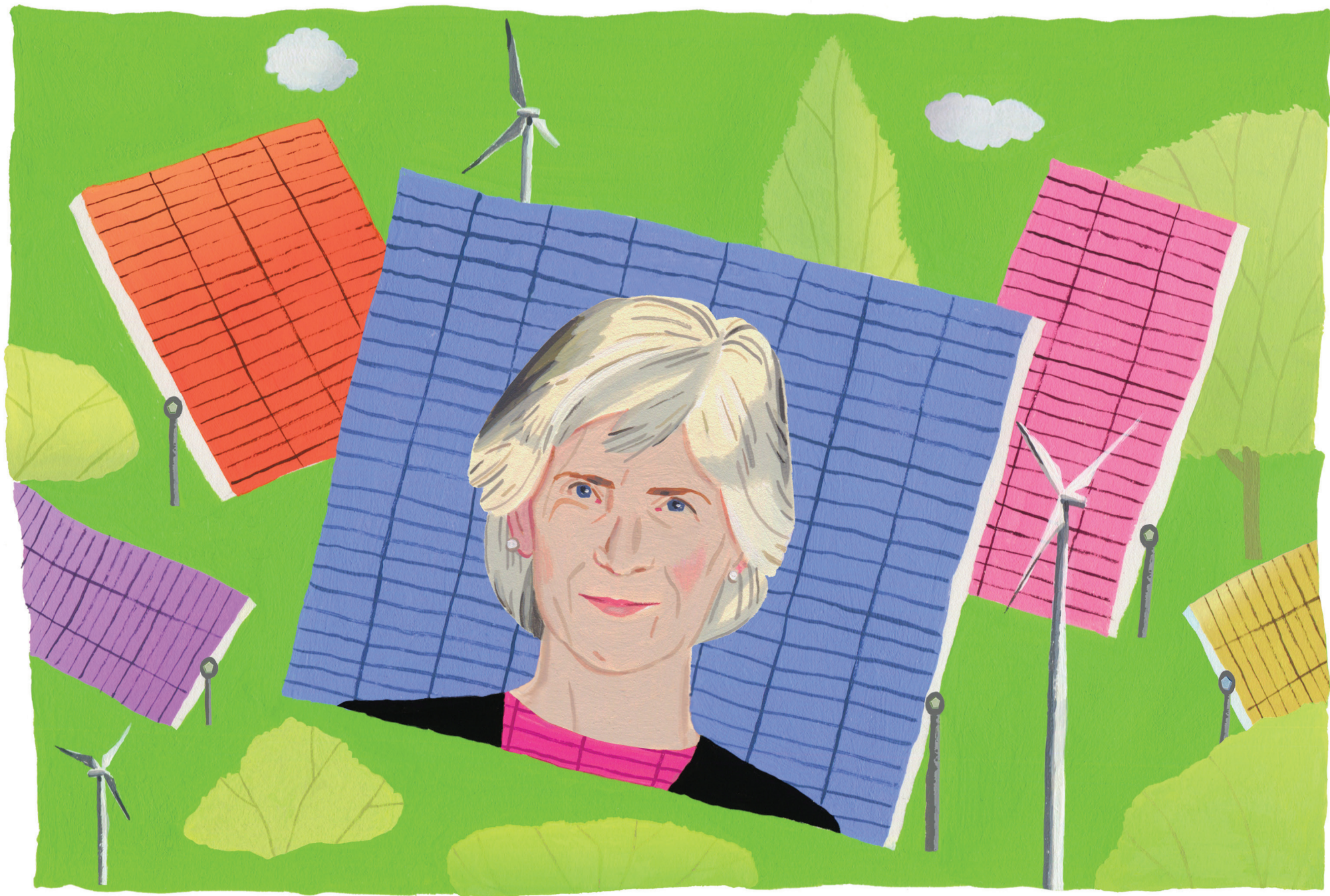


Photo by Leah Lee



**"Dr. Sabersky cared about my entire well-being at Caltech... I was invited to his home for Thanksgiving dinner, and when my mother sold her small business due to health issues, he and his family offered me a room at their house."**









# All In

BY MAUREEN HARMON

ILLUSTRATION BY JULIETTE BORDA



The key to a more sustainable future? Make sure everyone can join the hunt for solutions, says National Energy Technology Laboratory director Marianne Walck.

**Marianne Walck, PhD (MS '81, PhD '84)**

remembers the moment the glass ceiling broke at Sandia National Labs early in her career. It was the day the federal national defense laboratory promoted its first woman beyond middle management. "It was huge," Walck says. And it had ripple effects: Soon, other women were promoted to larger leadership positions, and Walck was able to see, for the first time, female scientists like herself in executive positions.

Today, Walck is director of the National Energy Technology Laboratory (NETL) and is often photographed giving speeches, meeting with scientists, and talking with political and business leaders. As NETL director, Walck oversees the execution of a \$1.3 billion budget, and NETL is additionally tasked with implementing \$30 billion in funding from the Bipartisan Infrastructure Law and Inflation Reduction Act. She also manages more than 1,400 technical and professional staff members, including

scientists, engineers, economists, research support staff, technical project managers, procurement experts, and attorneys across three R&D sites—in Albany, Oregon, Morgantown, West Virginia, and Pittsburgh, Pennsylvania—and two strategic field offices.

She doesn't always enjoy the spotlight, but she knows her appearance in photos and at events matters, serving as a signal to other women thinking about career progression. And even though Walck has made it to an executive position herself, she knows there's much yet to be done in building more diversity and inclusivity in the STEM fields. "The number of times I've been the only woman in the room, even within the last five to ten years, is still fairly high," says Walck, who is also a member of the Clean Energy Empowerment Education Initiative (C3E), dedicated to advancing women in clean energy.

Here, we talk to Walck about one of the world's most pressing issues—the transition to clean energy—and the ways inclusivity will help us get there more quickly.



**We're facing some tough challenges as a global community. How does inclusivity play a role in meeting these challenges?**

**Marianne Walck:** An inclusive environment is critical to solving the issues we need to tackle in energy. We need to build safe and collaborative lab environments, where scientists and others feel safe constructively challenging their peers. People hold back ideas when they don't feel comfortable or when they feel like their ideas might not be considered. I've done it myself. We also need to build more inclusiveness to retain talent. Attracting top minds is one thing—keeping them is another. People talk a lot about representation and inclusiveness today, but much of the conversation is around compliance: making sure we are representative because that's the right thing to do. But we need to think beyond that—attracting, retaining, and mentoring underrepresented communities in the science and tech space is paramount to getting better solutions to some of these incredibly challenging problems.

**Where do we start?**

**MW:** Typically, the largest female population on a lab staff is in non-executive positions: technical staff scientists, bench scientists, engineers, or modelers. Why is that? It could be that women are not recognized for their contributions for whatever reason. Maybe we don't toot our own horns enough. I remember my mother telling me, "Just do great work, and people will notice you." Well, that's not always the case—and it took me a long time to realize that. You do need to be able to talk about what it is you've accomplished and get people to notice. I also think women are not being provided opportunities for various reasons. Maybe she's considered too quiet, or her male supervisor assumes she might not be interested in a traveling position because she has children. As a leader, I always question my managers. I encourage

them not to make assumptions and to be sure they're making opportunities visible to all staff.

**It's not only building inclusivity in the lab, but it's making sure we're creating solutions that are available to everyone. Where are we in terms of bringing energy solutions to underrepresented populations?**

**MW:** We're still in the first stages of this work. It's very clear that climate effects are more rampant in lower socioeconomic areas. Fixing that is going to be long-term, expensive, and very difficult. When we're developing new technologies, we are always looking at how they may be deployed in an environmentally friendly manner in every environment. We're making sure all the applicants for funding address those issues in their applications.

We are also looking at how to help communities that could be left behind in the energy transition. Communities that depend upon fossil fuel extraction—coal mining, oil and gas—need to have clean energy jobs available to them.

Lastly, we have many technologies available, but we need to scale them so we can start really having an impact on the globe. We have to do our part and provide technology so other nations can do theirs.

**As we talk about the future of energy and look at what's to come, what are the three things you wish we were talking about that we're not discussing?**

**MW:** One, we need to acknowledge that this transition is going to be messy. There will be job disruptions. There will likely be environmental disruptions—hopefully in good ways. Two, this will cost money. If we want outcomes that will benefit our planet long term, it will be expensive. I think many people think this should be free, but it won't be free. And three, the STEM fields are not nearly as diverse as they need to be to get the best

**"When we think about 'the table,' leaders need to be cognizant of who is getting a seat—whether through hiring or through an invite to a brainstorming session."**

outcomes through the transition. We need to be bringing the ideas, opinions, and concerns of people from different backgrounds and cultures to the discussion. The more inclusive this process is, the better the outcome.

**What should we be doing right now to ensure that we have diversity and inclusivity at the decision-making table?**

**MW:** We have to start early and educate young girls and underrepresented communities about the opportunities in STEM. We're getting better at nurturing these interests, but we're still not engaging these populations early enough. We're losing future talent.

We're also losing talent at the college level. We have structures in place that prevent great minds from lower socioeconomic backgrounds from getting to or finishing school.

And we lose another whole group when the labs or meeting rooms don't feel safe, when talented people feel uncomfortable with their colleagues or unable to achieve the things they want to do in life outside of the lab—like travel or have children or care for a partner or parent.

Much of this will depend on leadership. When we think about "the table," leaders need to be cognizant of who is getting a seat—whether through hiring or through an invite to a brainstorming session. As leaders, we have to be aware of our own implicit biases so we can watch for them and challenge ourselves to lead change. ■

## Miles and Miles of Mojave

NICK VAN BUER, PHD (BS '05), a geology professor at Cal Poly Pomona, trekked 530 miles across the Mojave Desert from January to March 2022 to explore its geological wonders. He documented his journey in a YouTube series called "Across the Mojave on Foot," which tracked his work finding and collecting samples—including granite remnants that seem to be the result of ancient super-volcanoes. Despite grueling stretches, Van Buer pushed the limits of his physical and mental endurance and captured the essence of the region's geological wonders—turning the desert into a classroom, a laboratory, and an endless source of inspiration for future geologists.

IMAGE: NICK VAN BUER



ENRICHING



[ *Enriching* ]

# MOTHER *Nurture*

*How Maneesh Jain and  
Mirvie are modernizing  
maternal health*

*By April White*

*Photography by Mitch Tobias*







*Maneesh Jain, PhD (BS '90) has spent his career seeking out the next scientific frontier, where rapid innovation can make a significant difference in people's lives. Today, he says, that frontier is maternal health research.*

The need for such work is obvious: In 2020, a woman died every two minutes from preventable pregnancy-related causes, according to the World Health Organization. The risk to mothers has long been highest in sub-Saharan Africa, but in recent years, North America and Europe have seen an increasing number of deaths among pregnant people and those who have recently given birth. In the United States, the maternal mortality rate nearly doubled between 2014 and 2021, with the biggest increase in risk among Black women.

"We've gone backwards in the last two decades, and that's staggering," says Jain, a serial biotech entrepreneur. Part of the problem is that maternal health has been historically understudied—but there is a ready remedy: Jain believes that many of the same scientific advancements in genomics and machine learning that have, for instance, led to earlier cancer diagnoses, can also be used to identify pregnancy complications months before dangerous symptoms arise. Pregnancy doesn't have to be a "black box," he says, and in 2018 he cofounded Mirvie, a startup developing RNA analysis tools, to prove it.

This isn't what Jain thought he would be doing when he was studying at Caltech in the late 1980s. After a freshman-year Summer Undergraduate Research Fellowship project, he planned to pursue a career in laser physics. But while he enjoyed the work, "I was a few decades too late," he says. Laser physics research had been pioneered in the 1960s; Jain wanted to be a part of a groundbreaking moment like that. "I got quite curious about what field might be approaching that frontier stage, entering a 'golden decade' where all the advances are so new that you are really pushing the field forward rapidly," Jain recalls. In the mid-1990s, that curiosity led him to the Human Genome Project—an international effort to

map human DNA. Such knowledge, Jain believed, would provide the launching pad for scientific discovery in the 21st century.

Jain had also expected to spend his career in the lab, but as industry began to join academia in advancing the field of genomics, Jain saw an advantage in entrepreneurship: "I got to see just how fast industry can move in making a product that can impact lives."

In the 2000s, during what he considers genomics's first "golden decade," Jain launched a biotech startup to help scale genetic analysis, giving scientists the tools to evaluate 20,000-plus genetic changes at a time, and another with the goal of creating a more affordable benchtop device to sequence the genome. "The field was really young," he says. "The first companies were focused on how we could do data generation more efficiently."

In the second golden decade, Jain turned his entrepreneurial attention to applying this new data to an area where it could have the most impact. He focused first on early cancer detection through "liquid biopsies"—basically, diagnosing cancer from the analysis of DNA in a blood sample instead of via an invasive tissue biopsy. Today, he sits on the board of directors for Adela, a company he cofounded, which is testing the effectiveness of this approach on a wide array of cancers.

Mirvie, Jain's current company focused on maternal health, is taking the science one step further, analyzing the RNA in a blood sample. Unlike DNA, which never changes, RNA is dynamic and varies across tissues and over time. DNA analysis can identify, for instance, Down syndrome in a fetus, a condition determined by the genetic contributions of the parents at fertilization, but RNA can track complications that arise throughout a pregnancy—conditions such as preeclampsia. Preeclampsia is a hypertensive condition that occurs in an estimated one in twelve pregnancies in the United States and can lead to seizure, stroke, or even death. It is often signaled by high blood pressure in the third trimester.

"But the biological basis for preeclampsia starts quite early, about the end of the first trimester or early in the second trimester," Jain explains. Early research has shown Mirvie's RNA analysis can detect preeclampsia months in advance of the emergence of symptoms in 75 percent of cases. Mirvie recently completed a larger

*Jain believes that many of the same scientific advancements in genomics and machine learning that have, for instance, led to earlier cancer diagnoses, can also be used to identify pregnancy complications months before dangerous symptoms arise.*

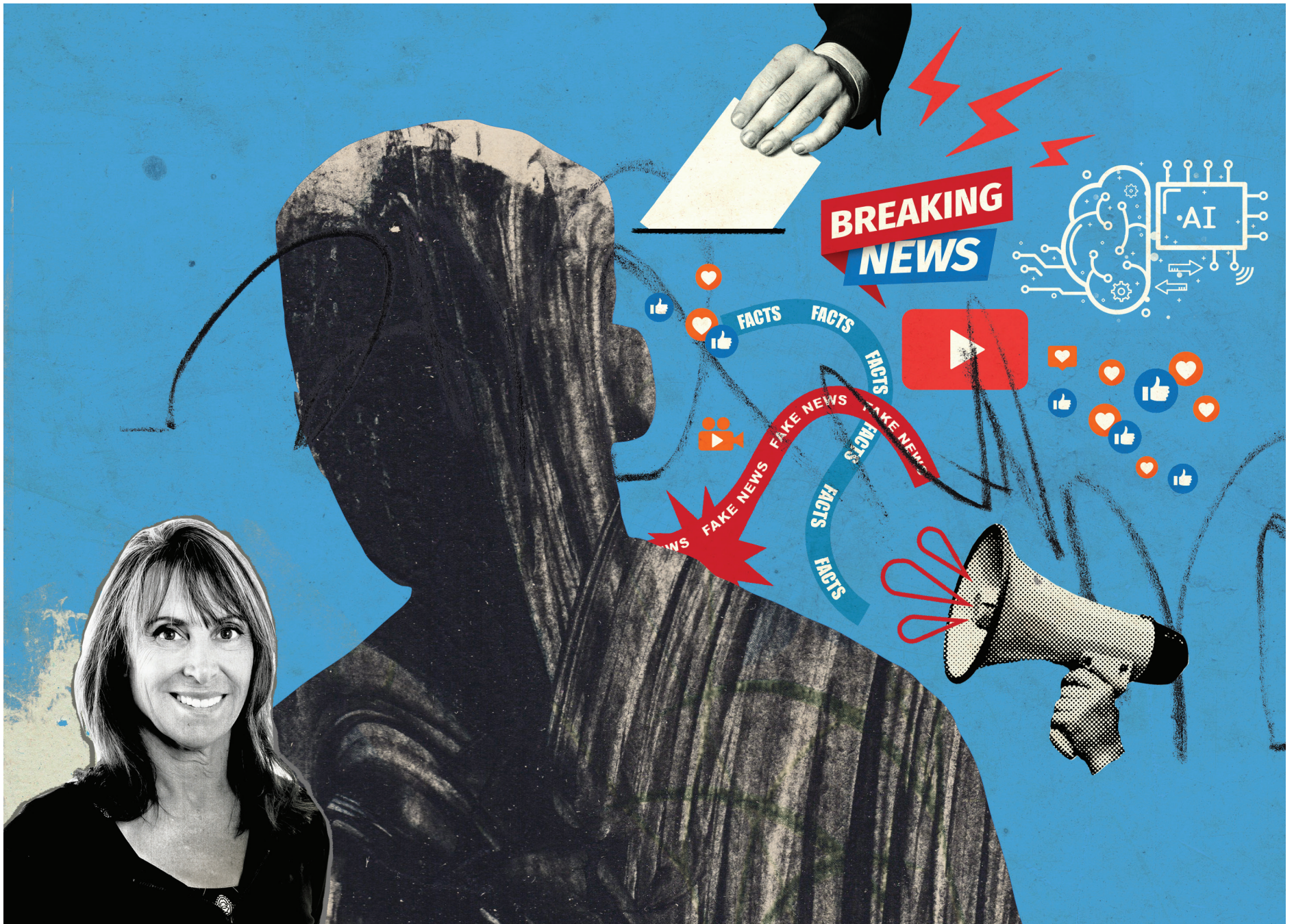


10,000-plus-person study in the United States, with plans to publish its results later in 2024, and a study of preeclampsia in sub-Saharan Africa is currently underway.

If pregnancy complications like preeclampsia can be diagnosed earlier, they can be treated earlier, hopefully with improved outcomes, Jain says. “We definitely don’t have all the treatments [in maternal health] that we do in oncology. We know that pregnancy health is probably two to three decades behind fields like oncology, but hopefully we can leapfrog and catch up pretty quickly.”

Jain is hopeful we are at the dawn of a third golden decade for genomics, a decade that will change lives for generations. “People still largely think of pregnancy as what happens in nine months or 40 weeks,” he says. But for mother and baby, “what happens in those weeks actually makes a lifetime impact.” ■









By Dan Morrell

Illustration by  
Michelle Thompson

## AI, DEEPFAKES, AND MISINFORMATION ARE ALREADY COMPLICATING THE POLITICAL LANDSCAPE. HOW CAN THE AMERICAN PUBLIC NAVIGATE THIS ELECTION SEASON?

**Journalism was a revelation for FAYE FLAM (BS '85).** There was no family history in the field or mentors guiding her to the profession. And she certainly didn't think it fit her demeanor. "I always thought that journalism was not a good profession for people who are shy and nerdy," says Flam, a science columnist for Bloomberg and former staff writer for *Science* and *The Philadelphia Inquirer*. "Then I discovered that it was actually a pretty good profession for people who were shy because you have to be good at letting other people talk about themselves, listening, and often having a long conversation where you really hardly say anything," she says. "You give the other person the spotlight, and you can really learn things in depth from that position."

Today, Flam asks questions about everything from astrophysics to the reliability of medical studies, and, increasingly, the science of disinformation, with recent columns on how to spot political deepfakes and ways consumers can avoid fake news. In this conversation with *Techer*, Flam talks about how disinformation works and how we might be able to arm ourselves against its onslaught—just in time for the election season's media apex.

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### What makes for effective disinformation?

**Faye Flam:** A couple of years ago I interviewed a former propagandist who'd worked for the Czechoslovakian intelligence service, which was run by the Soviets. He eventually managed to defect to the US and become a professor, and he told me that the most effective disinformation needs to be mostly true, and the false part should resonate with people's existing beliefs.

Another thing that can be convincing is the illusion that lots of other people have bought into an idea or conspiracy theory or that lots of people trust some authority figure. On Twitter, fake accounts known as bots can make it look like hundreds or thousands of people agree with posts that aren't well supported, or that alleged experts are wildly popular.



**"IT'S HARD TO KNOW AT THIS POINT**

**WHETHER AI IS GOING TO MANIPULATE**

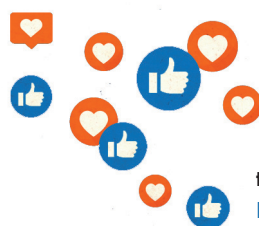
**PEOPLE IN AN INHERENTLY NEW WAY OR**

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**THEIR SCREENS."**



**Meta has said that they're going to start putting labels on disinformation and Google says it's coming for YouTube. You've written about some of the "bot policing" that already exists on platforms. What are the limits to tech solutions to this issue?**

**FF:** There's some great research on the proliferation of bots and tools that can identify them. But those who've been tracking bots say AI will allow bad actors to make them ever more realistic, so creators of misinformation could remain a step ahead of those trying to police it. That means social media users will have to become more skeptical.

And identifying misinformation isn't that easy—even though people think that they know it when they see it. During the pandemic, there was so much uncertainty and scientists were learning as they went along. Some of what was labeled as misinformation was really legitimate minority opinion or involved value judgments—especially about contentious issues such as school closures or the origin of the virus.

**What can we do as news consumers or media consumers to best arm ourselves against disinformation?**

**FF:** Try to read from sources that are accountable—that have to admit when they get things wrong. And consume media from diverse sources.

All the media outlets I've worked for are accountable. We have to write corrections if we get things wrong, and anyone making things up would be fired, just as scientists making up data could be fired for fraud. But with some of the web-based publications cropping up—some of them relying on AI to generate stories—there's no accountability. You can say anything. So it can be confusing for people to navigate this landscape of stories as they get pulled from these different sources and spread around on social media. Someone I interviewed

compared today's media to the Turkish bazaar, where you've got this crazy maze of different vendors and it's hard to even find your way out of it. Some people might be honest, and some people might be trying to cheat you.

**Deepfake material has already been used in elections. There was a fake Joe Biden robocall deployed in New Hampshire. There have been deepfakes meant to impact elections in Moldova and Pakistan. What has been the actual impact of these?**

**FF:** It's all so new, but there have been a few studies on the way people perceive fake images. Essentially, they've found that people are not as good as they think they are at spotting deepfakes, partly because they tend to look for the opposite of what they should look for. For instance, real photographs have certain kinds of flaws in the lighting, and people are seeing these flaws and saying, huh, that's a deepfake. But the deepfakes are often too perfect.

If you step back, though, lots of technological advances have been harnessed to mislead and manipulate people—radio, television, social media, and now AI. All these advances have also helped people become better informed. Recently a group of scientists showed that chatbots did better than humans at convincing people to let go of conspiracy theories. It's hard to know at this point whether AI is going to manipulate people in an inherently new way or whether people will adjust to it with increased skepticism, recognizing they can't always believe what they see on their screens.

**Broadly speaking, disinformation has eroded some of the public trust both in science and in journalism. What do you think those institutions have to do to get back that trust?**

**FF:** There have been some surveys done since the start of the pandemic showing a small drop in the amount of trust people put in scientists, but those probably reflect



people's skepticism about public health. I actually think that people do trust science, but don't always believe that our public institutions are using good science to make recommendations for us. During COVID, people never got a good scientific rationale for closed parks and beaches, outdoor mask mandates, or mandatory second and third booster shots.

In some ways, scientists shouldn't expect us to trust them unconditionally. They're supposed to show the evidence behind their claims. We're supposed to question them. That's the nature of the scientific enterprise. I would say that I trust the judgment of some scientists, and that's because they've earned it by offering reliable information and admitting to uncertainty or mistakes.

**You have to work through all of this as a science journalist. You have to be accurate, as you mentioned. What can the general news consumer learn from how you process and verify information?**

**FF:** That cuts to the heart of all this. Scientists and journalists in some ways do the same thing. We know that we're not going to get the absolute truth. There's uncertainty, there's bias. You see a little piece of the world and the best you can do is say, here's what I've learned, and here's how I learned it.

But I try to be humble about how much I really know and where things are getting speculative, and I gravitate toward interviewing scientists who are humble and realistic about the limits of their knowledge.

I'm lucky I get to deal with news about science, so I don't have to try to manipulate people into feeling outrage in order to generate interest. Instead, I can follow my own curiosity and try to stimulate curiosity in readers. ■



Caltech | Alumni

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# MEET THE NEW LEADER OF ALUMNI ENGAGEMENT



MARIO PERAZA, MEd  
Assistant Vice President  
for Alumni Relations  
Caltech Alumni Association

**“MY PHILOSOPHY IS THAT ALUMNI ENGAGEMENT MUST BE GROUNDED IN TRADITION WHILE REMAINING AGILE AND FLEXIBLE ENOUGH TO EVOLVE AND INNOVATE IN ORDER TO MEET THE NEEDS OF OUR DIVERSE ALUMNI COMMUNITY.”**

**F**OLLOWING A NATIONAL SEARCH, Mario Peraza, MEd, was named assistant vice president for alumni relations by Caltech, effective June 12, 2024. Techer sat down with him on his first day to discuss his vision and plans for the future.

Welcome to Caltech! We're excited to welcome you. What attracted you to the Institute?

**Mario Peraza:** Having completed my undergraduate degree in chemistry, I have always had a deep appreciation for the world-class science education Caltech provides. Throughout my nearly two decades of experience working with students and alumni, a significant portion of this time has been devoted to developing engagement strategies specifically for STEM alumni. This opportunity offers the chance to collaborate with Caltech's accomplished alumni, who have made countless impactful contributions across disciplines. Their achievements are a testament to Caltech's excellence, and I am eager to work closely with this community.

What is your vision for Caltech alumni relations?

**MP:** My vision is to build upon the outstanding work of the CAA and the Alumni Relations team, creating a world-class alumni engagement program for this world-class institute. My primary focus will be on cultivating lifelong relationships with alumni across all generations and life stages, and fostering a strong sense of community among our students and most recent graduates. Key initiatives will include developing innovative and thought-provoking science programming to pique alumni curiosity, celebrating the remarkable accomplishments of our alumni, keeping them well-informed about Caltech's latest successes and advancements, and facilitating opportunities for alumni to share their valuable expertise and insights with the Techer community. My hope is that this will nurture an engaged, vibrant, and continuously evolving alumni network.

How will you reach out to alumni from diverse backgrounds and ensure their inclusion?

**MP:** As a first-generation college student and Latinx alumnus, I have a personal understanding of the importance of creating programming that

is inclusive of all alumni. It starts with listening to the insights and lived experiences of our diverse alumni community. By seeking their perspectives, we can develop opportunities that accurately reflect their wide range of interests and backgrounds.

What I valued tremendously in my own alumni journey, and what I hope to nurture at Caltech, is programming that highlights diverse faculty, celebrates the successes of the next generation of students, and facilitates meaningful connections among alumni. This will ensure all alumni feel seen, heard, and part of the vibrant Caltech community.

How do you envision leveraging technology to enhance alumni engagement?

**MP:** Caltech alumni are spread across the globe, and our goal is to ensure they feel a strong connection to their alma mater, regardless of their distance from Pasadena. Similar to many other industries that adapted during the COVID-19 pandemic, academia had to find innovative ways to stay connected without traditional in-person events, lectures, and reunions.

Over the next few years, we will expand opportunities for hybrid programming that engage alumni regardless of their location. This includes leveraging the Techer Professional Network to facilitate meaningful mentorship connections between students and alumni, delivering compelling content across social media platforms, and using data to create personalized and highly relevant communications tailored to alumni interests and preferences.

By embracing technology, we can transcend geographic barriers and foster a sense of community that brings the Caltech experience directly to our global alumni network.

#### How do you describe your leadership style?

**MP:** Thoughtful and deliberative, with a strong focus on the people I work with. I deeply value taking the time to carefully listen to all key stakeholders, as this input informs the supportive and inclusive environment I strive to cultivate as a leader. This involves engaging with alumni leaders to understand their perspectives, seeking insights from campus partners and stakeholders, analyzing alumni interest survey data, and incorporating the interests, professional experience, and motivations of our talented alumni engagement staff.

My philosophy is that alumni engagement must be grounded in tradition while remaining agile and flexible enough to evolve and innovate in order to meet the needs of our diverse alumni community. A core principle guiding my approach is actively seeking input from alumni spanning various backgrounds, career stages, and geographic locations. This broad range of perspectives ensures that my leadership provides value that is supportive, inclusive, and responsive to all members of the alumni community.

Striking the right balance between honoring Caltech's storied history and traditions, while also embracing change and new initiatives that resonate with alumni, will be paramount. Through inclusive listening and data-informed decision-making, I aim to cultivate an environment that celebrates the rich diversity of our global alumni base.

#### What would you like to convey to Techers to inspire them to help evolve Caltech alumni relations?

**MP:** As alumni, you are among Caltech's most enduring and impactful legacies. You take the vision, knowledge, and values instilled by this institute out into the world, amplifying its impact through your incredible personal and professional accomplishments across communities worldwide.

Caltech has a commitment to staying connected with all of you. We celebrate your successes wholeheartedly and strive to keep you informed about the groundbreaking research and innovations continually emerging from campus.

However, to truly evolve and enhance our alumni engagement efforts, we need your input and participation. Share your interests, attend events when possible, read our communications, and respond to surveys—your perspectives are invaluable. We want to understand what you need and desire from your alma mater in order to provide meaningful value at every stage of your journey.

You inspire us to create alumni programming and opportunities that enrich your connection to Caltech. Together, we can shape an alumni relations program that equals the caliber of this institute. ■



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# Caltech



# IN MEMORIAM

*We mourn the loss of the following members of our Caltech alumni community*

## 1939

Melvin Levet (BS '39, MS '40)

## 1944

Robert Mapel (BS '44)

Charles Munger (CERT '44)

2020 Distinguished Alumni Award

## 1946

Harold Sarmiento (BS '46)

## 1948

Glen Mitchel (BS '48)

## 1949

A. Richard Boera (MS '49)

Arthur Spaulding (BS '49, MS '58)

## 1950

Allan Beek (BS '50)

Vern Edwards (BS '50)

Harold Leinbach (MS '50)

## 1951

Erdem Ergin (MS '51, PhD '54)

Joseph Mangin (BS '51)

## 1952

Paul Aagaard (BS '52)

John Boppert (BS '52, MS '53)

Theodore Wu (PhD '52)

## 1953

Stanley Wilkes (BS '53)

## 1954

Fred Anson (BS '54)

Roland Miller (BS '54, MS '55)

Samuel Moskowitz (MS '54)

Clarence Peterson (MS '54)

## 1955

Allen Brady (EX '55)

Richard Okada (MS '55)

Bernard Schweitzer (BS '55)

Salvatore Sutera (MS '55, PhD '60)

John Wolfe (BS '55)

## 1957

Thomas Bilhorn (MS '57)

Frank Borman (MS '57)

William Moeur (BS '57)

F. Donald Russell (BS '57, MS '58)

## 1958

Berken Chang (BS '58, MS '60)

Donald Chesnut (PhD '58)

Ellsworth Grell (PhD '58)

Charles Neuman (BS '58)

Lloyd Welch (PhD '58)

## 1959

Frank Childs (BS '59)

Donald Clayton (MS '59, PhD '62)

Harvey Fiala (MS '59)

Dennis Kuli (BS '59, MS '60)

John Rice (PhD '59)

Lawrence Tenn (BS '59)

## 1960

Allan Laderman (BS '60, MS '61)

Leonard Maley (BS '60)

Carl Morris (BS '60)

## 1961

Henry Abrash (PhD '61)

Shin-Kien Chow (MS '61)

David Kendle (BS '61, MS '62)

Glenn Schweitzer (MS '61)

## 1962

Gary Lorden (BS '62)

Maurice Whelan (MS '62)

## 1963

David Ollis (BS '63)

## 1965

Louis Rostand (MS '65)

## 1966

John Murray (MS '66)

Reiner Stenzel (MS '66, PhD '70)

Ronald Williams (BS '66)

## 1967

Bernard Sander (MS '67)

Eric Young (BS '67)

## 1968

Merle Riley (PhD '68)

## 1969

Francis Mason (BS '69)

## 1970

Uma Chowdhry (MS '70)

2013 Distinguished Alumni Award

## 1971

Ulrich Breitling (MS '71)

## 1972

Dwight Carey (BS '72)

## 1977

Eugene Berek (MS '77)

## 1984

Alix Herrmann (BS '84)

## 1987

James Kamm (PhD '87)

## 1997

John Mulcahy (BS '97)

## 2007

Jeffery Byers (PhD '07)

READ OR SUBMIT

OBITUARIES AT

ALUMNI.CALTECH.EDU/

IN-MEMORIAM

## 2025 CAA BOARD-APPROVED DIRECTOR & OFFICER SLATE



*On June 1, the Caltech Alumni Association Board of Directors announced the Board-Approved Slate of 2025 CAA Board Directors and Officers. Directors serve as stewards of the Association funds and mission, and are selected for their professional skills and alumni experiences.*

### Board-Approved Slate

John S. Abbott III, PhD (BS '74)

Frederic Caldwell (BS '96)

Edgardo Garcia-Berrios, PhD (PhD '11)

Tara Gomez-Hampton, PhD (PhD '11)

Rebecca Adler Miserendino, PhD (BS '06)

Miral Kim-E, PhD (BS '78)

Zachary A. Rivkin (BS '14)

Jasmine Sears, PhD (BS '12)

Elizabeth Stameshkin, JD (BS '03)

Jay Turner, MBA/MS (BS '01)

### Board-Approved Officer Slate

Chair: Dan Liebling, MS (BS '02)

Vice Chair, Finance: Tara Gomez-Hampton, PhD (PhD '11)

Vice Chair, Governance: Miral Kim-E, PhD (BS '78)

Vice Chair, Leadership/Outreach: Frederic Caldwell (BS '96)

## ANNUAL MEETING OF MEMBERS

**THURSDAY, SEPTEMBER 26, 2024**

Register to attend via Zoom at  
[alumni.caltech.edu/events/  
annual-meeting-2024](https://alumni.caltech.edu/events/annual-meeting-2024)

# Keuffel & Esser Alidade

[ *From the Archives* ]

The Keuffel and Esser (K&E) alidade was a vital tool for plane table surveying. It measures horizontal angles, determines bearings and distances, and features an optical telescope mounted on a stable base for accurate sighting and measurement. The alidade includes a protractor scale for precise angle measurements, adjustment knobs for fine-tuning, and a robust design suitable for fieldwork. K&E was a major manufacturer of drafting and surveying instruments from the late 19th to the early 20th centuries, and their high-quality instruments were widely used by engineers, surveyors, and architects before the invention of electronic surveying devices.

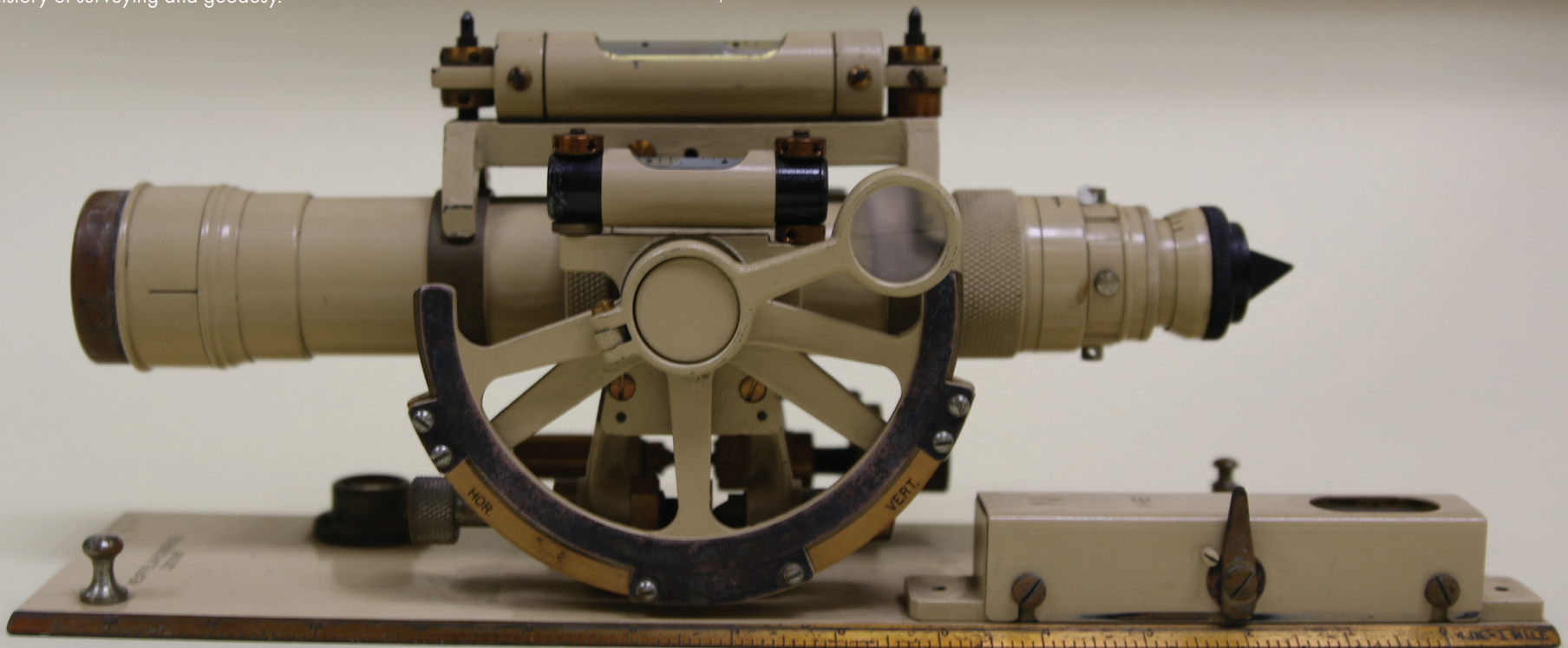
K&E alidades are renowned for their precision engineering and durability. They are crafted with high-quality materials that have stood the test of time. Vintage K&E alidades are now highly collectible, valued for their historical significance and engineering excellence. These instruments are often displayed in museums and educational institutions, showcasing the evolution of surveying technology and methods. Significant collections of these instruments can be found not only at Caltech but also at the National Museum of American History, highlighting their importance in the history of surveying and geodesy.

**ID #:** ST-GE-11

**DONOR:** DR. KERRY E. SIEH (USED IN HIS SEISMOLOGICAL RESEARCH IN SOUTHERN CALIFORNIA)

**COLLECTION:** CALIFORNIA INSTITUTE OF TECHNOLOGY ARCHIVES AND SPECIAL COLLECTIONS REPOSITORY

**MATERIAL:** STEEL AND BRASS



**Do you know more** about this specific instrument,  
or did you use one like it while you were at Caltech?  
Share your story with [alumni@caltech.edu](mailto:alumni@caltech.edu)



SEND ALL ADDRESS CHANGES TO:

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# 2024 ALUMNI WEEKEND & REUNIONS

**FRIDAY, OCTOBER 18 – SUNDAY, OCTOBER 20**

Milestone Reunion Dinners at the Athenaeum

2024 Distinguished Alumni Award Panel

SURF Seminar Day access

House gatherings

All-Alumni Celebration under the stars

Pacific Standard Time Art Exhibition: Art and Science Collide access

**REGISTER AT [ALUMNI.CALTECH.EDU/ALUMNI-WEEKEND](https://ALUMNI.CALTECH.EDU/ALUMNI-WEEKEND)**

