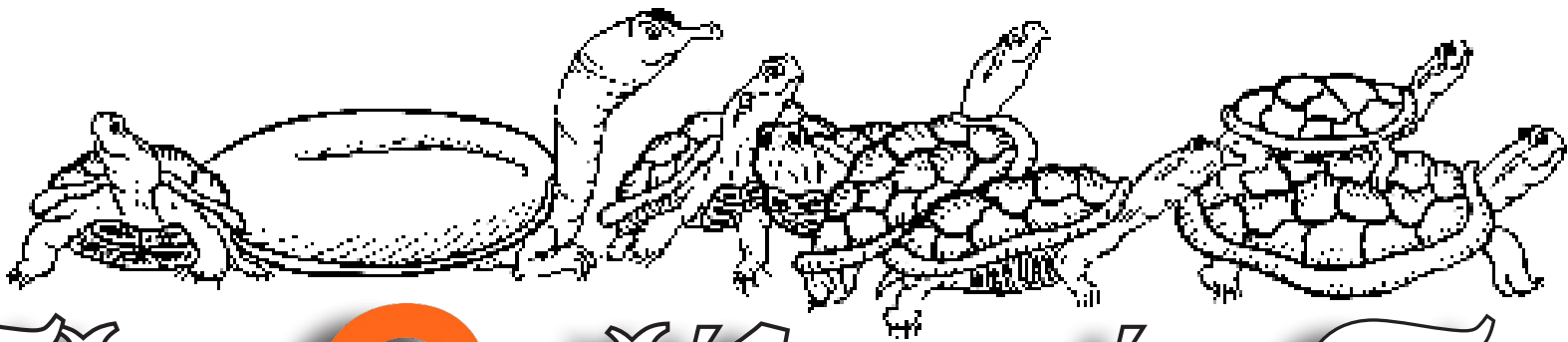




The California Tech

VOL. CXXIX No. 4

PASADENA, CALIFORNIA

TUESDAY, NOVEMBER 18, 2025

Richard Kipling, L.A. Times Veteran and Longtime Tech Advisor, Dies at 81

Damian R. Wilson
News

Richard Kipling, former director of the *Los Angeles Times*’ Minority Editorial Training Program (Metpro), advocate for diversity in the newsroom, and longstanding advisor of *The California Tech*, passed away on October 27 following a stroke. He was 81.

Kipling spent decades at the *L.A. Times*, where he held various editorial positions, including editor of the Orange County edition. He is best remembered at that institution for his visionary leadership of Metpro, the groundbreaking initiative he shaped into a national model for newsroom diversity.

Under his direction, Metpro trained generations of journalists of color, many of whom went on to prominent roles at publications such as the *L.A. Times*, *The New York Times*, and *The New Yorker*. Though his work met resistance early on, Kipling remained an unflinching and persuasive advocate for a more representative press corps—even as the industry’s financial pressures mounted.

After leaving the *L.A. Times* in 2009, Kipling joined USC’s



Richard Kipling (right), with graduates of the Minority Editorial Training Program and L.A. Times colleagues. (Photo: L.A. Times)

Center for Health Journalism, leading efforts to enhance public understanding of health policy through reporting. He continued to mentor Metpro graduates throughout his life.

At Caltech, Kipling further extended his commitment to training new journalists. He joined the institute in 2008 as a Lecturer in Journalism and (for over a decade!) taught students how to think like a reporter, both in the context of their own research and the world at large. Generations of Techers remember his thoughtful guid-

ance, firm standards, and deep belief in the power of clear, ethical reporting.

On a more personal note, Kipling was my journalistic touchstone. Even as support for the *Tech* waxed and waned—and student editors came and went, with the occasional challenging interregnum—Kipling remained our steadfast champion of the Caltech reporter. We couldn’t have asked for a better advisor.

May you rest in peace, Richard.

Remembering Richard Kipling, and the Future of Student Journalism at Caltech

Michael Gutierrez
News

When I took over the *Tech* Editorship in April 2023, I only knew one thing about journalism: it was going to stop happening at Caltech unless somebody stepped up to lead it. With a dream of remedying the post-pandemic admin-student animosity but zero reporting experience, I was in for a daunting task. Then Richard Kipling emailed me and offered to buy me a coffee.

After a storied career at the *L.A. Times*, Kip came to Caltech in the early 2010s as an adjunct professor of English. His purpose was twofold: teaching the only journalism class offered by the HSS division, and advising the only student newspaper on campus, *The California Tech*. 14 years later, I had the privilege of learning from Kip in both contexts, and found his passion, compassion, and integrity to be contagious. He helped me take my desire for cross-community communication and discipline it, to rebuild the *Tech*’s reputation as one of principled reporting after a long period of dormancy.

This wouldn’t be an easy process—nobody on campus seemed to trust the *Tech*. Faculty never bothered to read it, administrators always assumed we were trying to ‘gotcha’ them, and students were often unwilling to publish their true thoughts (or sometimes even the actual truth) for fear of retribution (only occasionally justified). I’ll be the first to admit, it was a rocky start—I made some questionable editorial decisions along the way. Many influential Institute figures were generous with their criticisms which, while not entirely unfair, were not entirely constructive. But we always had Kip to offer a warm smile, a rock-solid journalistic moral compass on which to cling, and a suggestion for a new story to pursue. Our reporting principles, printed on the back of every *Tech*, were directly informed by his approach.

There was no doubt about it—Kip was in it for us, the stu-

dent journalists, and the community we work to inform. The HSS division certainly didn’t give him many reasons to stay, consistently refusing to count his class toward undergraduate writing intensive requirements or, indeed, to take student journalism seriously at all. He continued advising the *Tech* after they fired him at the end of 2024. (Purely budgetary reasons, the division assured him in their email. There was more demand for creative writing classes, and simply not enough money to go around.)

He even stuck by our side after his Altadena home burned down at the beginning of 2025. All the undigitized paper ‘papers’ documenting decades of Kip’s work—decades of world history, from the morning of September 12, 2001 back to the fall of the Berlin Wall and beyond—were incinerated. (He had brought a few of them in to show me and his class just months earlier. The loss is stomach-churning. Both losses.)

I’m no longer in the loop on the progress of this, but here I have to thank the Student Affairs division (especially Diana Jergovic) for offering to search for a new advisor for the *Tech*, since the HSS division decided it was beneath them. My aspiration for the winning candidate is that they will help elevate student journalism at Caltech. If you ask me, all Caltech students should graduate with practice in the art of objective, clarity-driven, public-directed communication that is the hallmark of news reporting. Science communication is especially critical these days. My vision is of an Institute with a world-class journalism program (like a Science Journalism minor??), and a community positively entangled in the kind of tight-knit relationships that just can’t be formed digitally. I’m not sure if it was Kip who first inspired that in me, but I’ll always associate that sentiment with him. I hope that’s how we’ll all remember him.

PRINT JOURNALISM IS NOT DEAD!

Behind Integrated Core, Caltech’s Grand Experiment in First-Year Teaching

Damian R. Wilson
News

On a late September morning, a caravan of first-year students and faculty packed into SUVs and headed north along Highway 395. They stopped under the sweeping blades of a Mojave wind farm, peered into boiling geothermal pools on a Navy base, stood among the twisted tufa towers of a Mono Lake, and walked the grounds of the Manzanar incarceration camp. Somewhere between the talk of megawatts and magma chambers, the history of L.A. hydropolitics, and the ethics of locking up your own citizens, the group’s first class quietly started.

This is Caltech’s pilot Integrated Core.



Students admire Crowley Lake, gazing at the Sierra Nevada mountains. (Photo: Paul Asimow)

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“Richard Kipling was a wonderful teacher and friend who introduced me to the exciting world of journalism, a field that completely changed how I approach life. Richard taught me how to report on the toughest, most serious topics, all while being so patient and supportive. He truly made Caltech a better place, and enabled others to do the same through advising the *Tech*. Richard, I will miss you dearly.”

- Maxwell Montemayor (BS ‘25, CNS, Blacker)

wellness.caltech.edu

Mindfully

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Open to all grads & undergrads

30-min pre-screening required

MORE INFO

SEEKING UNIQUE ORNAMENTS FOR FIRE VICTIMS

Many homes in Altadena are preparing for their first holiday season after losing everything. We are seeking donations of **ornaments, stars, menorahs and kinaras**- vintage, meaningful, handcrafted, or uniquely beautiful. If possible, please include a short note sharing its story!

Scan the QR code for our **mailing address**, or **drop off** locally at:

★ Prime Pizza - Altadena

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Let's spread hope and healing this holiday season!

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ExPLiCiT

Presents Wilde's

The Importance of Being Earnest

Directed by

Miranda Stewart

Performances Nov 21-23

Auditions Oct 9 and Oct 11

Scan the QR code to sign up for auditions

CALTECH CENTER FOR INCLUSION & DIVERSITY

Transgender Day of Remembrance

In honor and remembrance of the lives lost to transphobia and violence.

Thursday, November 20th

CSS 2nd Floor Common Area

12pm - 1:30pm

Join us for lunch, arts and crafts, and a community altar.

Affinity Spaces are open to anyone interested in participating, regardless of race, color, national origin, sex, or any other protected characteristic.

Editor's Note: We want to hear your perspective!

We strive to represent every voice in the Caltech Community with fairness, accuracy, and impartiality in our news reporting. If you think we missed something, or just want to share your thoughts about a topic we've reported on, I encourage you to submit a Letter to the Editor!

Send submissions or contact the Tech editorial team at

tech@caltech.edu

Submissions are due at 12 p.m. on the Saturday before each biweekly Tuesday publication.

Gut Feelings: How Microbes Might Be Shaping the Mind—and More

Ryan Ma
News

One afternoon, a father gave his young son an antibiotic for a routine throat infection—and watched in astonishment as the boy’s autism symptoms seemed to ease. The child grew more social and engaged, almost as if a fog lifted. This wasn’t a miracle cure or a coincidence, scientists now believe. Instead, it may have been an unintended tweak to the gut microbiome—the trillions of microbes living in our digestive tract. Once seen as passive passengers, these gut microbes are emerging as quiet conductors of human health. Researchers are discovering that our “gut feelings” are more than metaphorical: microbes in the gut can shape the mind, tune the immune system, and even influence the fate of cancer therapies and organ health. In a reflective exploration of science’s new frontier, we delve into how the microbiome connects to our brain, immunity, and metabolism, helping us rethink what keeps us healthy.

The Current Frontier

Not long ago, the idea that gut bacteria could affect the brain sounded far-fetched. Now it’s a fast-evolving field. The gut and brain talk to each other through nerves, hormones, and immune signals—and microbes often whisper the cues. In autism, for example, scientists have noticed intriguing patterns. Children with autism frequently have digestive problems, and studies have found their gut microbiomes differ from those of other kids. In [one small clinical trial at Arizona State University](#) in 2022, researchers transferred healthy gut bacteria into children on the autism spectrum. The result? Many of the kids saw im-

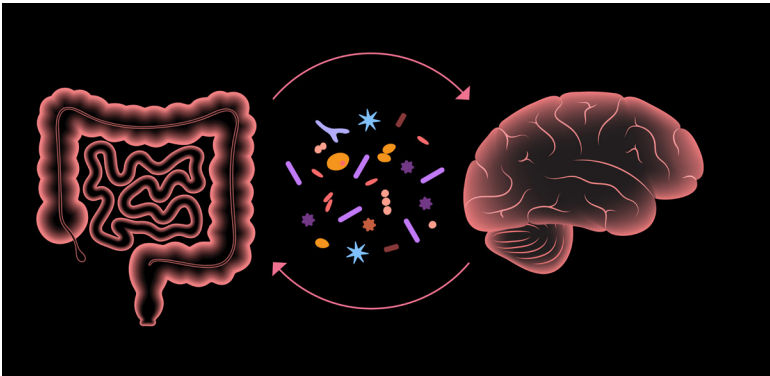
provements not only in tummy troubles but also in behavior and social engagement that persisted two years later. By the trial’s end, parents reported roughly a 24% reduction in autism symptoms; two years on, that improvement approached 47%. “Our long-term goal is to understand the functional role of the gut microbiome... and identify therapeutic targets to improve GI health and behavior in children with autism,” explains lead author Khemlal Nirmalkar, who highlights the hope in tweaking gut microbes as a therapy.

It’s not just autism. Take Parkinson’s disease, a neurological illness once thought to start solely in the brain. New evidence suggests Parkinson’s may partly begin in the gut. In a [2022 study published in Nature Communications](#), Prof. Haydeh Payami and colleagues at the University of Alabama at Birmingham found a “widespread imbalance” in the gut microbes of Parkinson’s patients. Harmful bacteria that can trigger inflammation were overabundant, while beneficial, neuroprotective microbes were depleted. In fact, the bacterial strains that produce a curli protein—capable of inducing misfolded proteins associated with Parkinson’s—were rife, potentially driving disease pathology. At the same time, microbes that help tamp down inflammation or produce important neurotransmitters were scarce. These findings, from a study of over 700 people, paint a vivid picture: the gut of a Parkinson’s patient is like an ecosystem out of balance, possibly feeding into the chain of events that damage the brain. It’s a reminder that the “gut-brain axis” isn’t a mere curiosity; it could be central to understanding illnesses like Parkinson’s, depression, and beyond.

Even mood and mental health have surprising microbial links. In 2019, a Belgian team led by Prof. Jeroen Raes [conducted a population-level study](#) and noticed that two common gut bacteria, Coprococcus and Dialister, were consistently missing in people with depression. These microbes are known to produce substances like short-chain fatty acids, which can communicate with the nervous system. Their absence might mean a loss of some “feel-good” chemical production in the gut. Other researchers have gone a step further, transferring gut bacteria from depressed patients into mice; remarkably, the mice often begin to exhibit anxiety or depression-like behaviors. No one is saying that an “imbalance” in gut flora is the sole cause of depression—depression is far too complex for that—but these studies urge us to broaden our view of mental health. They suggest that someday, treating depression might involve not just the brain, but also those tiny tenants in our intestines.

A New “Gut Feeling” in Medicine

From brain disorders to cancer therapies to metabolic diseases, the gut microbiome’s fingerprints are turning up everywhere. Of course, this field is still young. Many findings so far are correlations—intriguing links that don’t yet prove cause and effect. Scientists caution against hype: tinkering with your microbiome is not a panacea, and oversimplified probiotic fads are far ahead of the evidence. Sarkis Mazmanian, a Caltech biologist who helped ignite the so-called “microbiome revolution,” often reminds that correlation in these studies is not causation, urging people to scrutinize rigorously before drawing conclusions. (See [his](#)



The bidirectional communication between the gut and the brain, often called the gut-brain axis. (Image: Arizona State University)

[2022 review](#), published in Science, for more.) It’s important for readers and researchers alike to maintain a healthy skepticism as we explore this new frontier. The microbiome is a complex ecosystem, and modifying it in humans isn’t straightforward—what helps one person could hurt another.

Yet, there is a growing sense of possibility and wonder. Just a generation ago, who would have imagined that microscopic gut dwellers might influence whether someone develops depression, or responds to a cancer drug, or suffers kidney damage from their diet? Each new discovery chips away at the old notion that our bodies operate in isolation. Instead, we’re learning to see ourselves as super-organisms—part human, part microbial. This perspective doesn’t diminish our agency; rather, it adds a new layer to how we might care for our health. It encourages curiosity: Could feeding our gut microbes certain fibers boost our mood? Could a tailored probiotic regimen one day assist in treating Parkinson’s or autism? These questions would have seemed outlandish not long ago, but now they inspire serious research.

In clinics and labs around the

world, a more holistic medicine is quietly taking shape. Doctors and scientists are beginning to ask patients not just “What did you eat?” but also “Who’s living in your gut?” The answers might help predict who will benefit from an immunotherapy or why one person’s blood pressure spikes on a high-salt diet while another stays stable. The medical importance of the microbiome is emerging as more than just a buzzword—it’s a rich, nuanced field that sits at the intersection of biology, nutrition, immunology, and even neurology.

Conclusion

As we stand at this crossroads, it’s wise to temper excitement with critical thinking. The microbiome is not a puppet-master pulling all the strings of disease, but neither is it a bit player. It’s more like a partner in the grand symphony of our physiology. Learning to listen to our microbial partners—and maybe even compose music with them—could transform how we prevent and treat illness. So the next time you get a “gut feeling,” remember: it just might be your second brain (your gut) and its microbial roommates trying to tell you something.

Nostalgia

Camilla Fezzi
Inner Voices

They call it the American dream, but no one talks about the weight it places on your shoulders.

Everyone speaks of excitement, achievement, determination. Yet no one mentions the moment you close the door at night and realize that what remains is not satisfaction, but a kind of burning silence—foreign and heavy. Sometimes it’s a metallic quiet, like the laboratory I’ve just left; other times it’s the sound of the wind moving through the trees on campus—gentle, but constant, always distant.

Every morning the sun in Pasadena filters through the blinds and falls onto my floor.

It’s a bright, clear, almost arrogant light—so unlike Verona’s. The sunlight back home was soft, golden, draping over the red rooftops and fading slowly along the cobblestone streets. Each ray seemed to have its own scent, its own rhythm: the calm pace of a life that did not hurry.

At Caltech, time is never enough. Every day is a chase—a string of experiments, calculations, deadlines. I feel as though I live inside a clock that never stops ticking, a mecha-

nism perfectly wound, where the only unpredictable element is me. There’s no room for nostalgia, I tell myself. But it follows me everywhere: in the pocket of my lab coat, in my distracted thoughts that return home when they should focus on equations.

I miss Verona.

I miss walking along the Adige River at dusk, when the water mirrored the glow of the lampposts and my footsteps echoed beneath the arches. I miss the smell of fresh bread wafting from the bakery at sunrise, the baker’s morning greeting, the woman at the market who always asked, “Everything okay, dear?” even though she barely knew my name. There was a sweetness in those small gestures, in those rituals that once seemed insignificant and now mean everything.

And I miss Bosco Chiesa Nuova at Christmas.

The snow that fell so slowly it seemed suspended in time; the smoke rising from the chimney; the scent of burning wood mingling with the aroma of roasted meat.

I miss the house filled with voices, the clinking of glasses, the golden light from the lamps warming the photographs on the walls. I miss my uncle, holding a glass in his hand, breaking every silence with a joke. He could make everyone laugh, even when there was nothing to laugh about. His voice filled the entire room, and I laughed, ev-

ery time, even though I already knew the punchline. It was an old, familiar laughter—a sound that felt like home. Sometimes I close my eyes and see him again, sitting by the fire, telling yet another story, the kind that lives forever in memory, maybe they were always the same, but to tell you the truth, even if I know them for having been repeated a thousand of times, i would still listen to them and laugh, laugh to cry.

And then there’s my mother—her calm that seemed infinite, her quiet strength.

I remember the evenings in the kitchen: the faint clatter of dishes while I studied, the old radio humming in the background, the scent of basil in the air. I miss Matteo, my brother, his way of telling stories that made no sense but somehow mattered anyway, constantly disturbing me when I was studying and coming up with new soccer information. Our endless arguments about who would take the last bite of cake or choose the playlist in the car. It sounds trivial, but love lives in those small, unimportant moments that make up a life.

And there’s Betta, my childhood nanny, who loved me as if I were her own. She raised me with the tenderness of someone who has given her whole life to caring for others. I miss the sound of her steps in the hallway, her hands moving quickly in the kitchen, her scent of lavender and clean laundry, her

fabulous panzerotti. I remember the comfort of her arms when she held me, the quiet strength of her voice when she told me everything would be all right. She isn’t just a memory—she is my childhood, stitched into the fabric of who I am.

Caltech, for all its brilliance, can’t compete with that.

It is a place of fluorescent lights, perfect machines, endless aspirations. The campus hums with ambition—but also with exhaustion. Here, people are measured in accomplishments, not emotions. We talk about success, research, and progress, but never about the cost of moving forward.

Sometimes I ask myself if it’s worth sacrificing the lightness of affection for the precision of achievement. I answer yes, because I love what I do—but my heart knows that no discovery, no award, will ever fill the empty space left by a shared table and the laughter of those I love. The silence every night destroys me.

Nostalgia has become my most loyal companion.

It’s not nostalgia for a place—it’s longing for people.

I miss my mother’s laughter, my uncle’s jokes, the quiet sound of Betta’s voice saying goodnight. What I miss most is the physical presence of family, the certainty of belonging somewhere. Because home isn’t a building.

Home is a collection of faces, of gestures, of voices.

Home is knowing that someone waits for you, no matter how far away you are.

When I think of Verona from afar—in memory, in dreams—I realize I didn’t just leave a city. I left a part of myself.

Caltech teaches me to push boundaries, but Verona taught me to feel. And one cannot live fully without both.

Now I understand that growing up means learning to co-exist with absence—to hold gratitude and longing in the same hand. Life, perhaps, is an endless rhythm of departures and returns, even when those returns exist only in our minds. When night falls over Pasadena and the campus grows quiet, I open the window and look up at the stars. I wonder if they are the same stars watched by my mother, by Matteo, by Betta, by my uncle. I like to think they are—that they watch over all of us, binding our distances with light.

Maybe nostalgia isn’t sorrow, but love’s persistence.

Love stretching across oceans and years, refusing to fade.

And then I realize that even though I’m here, on the other side of the world, I haven’t truly lost my home.

I carry it within me—in everything I do, in every dream I chase, in every memory that keeps shining quietly within the silence.

A Pinterhouse Fit for the End of the World

Damian R. Wilson
The Inside World

Page Hovse kicked off Inter-house season with a full-throt-tle throwback to the year 2000—back when the world braced for computer doom and dial-up tones counted as much. Announced with the immortal words, “Before tar-iffs, TikTok, and Taylor, AI, Apple, and the Avengers, it was... Y2K” (and signed, in true Page fashion, “It’s Pinterhouse,

bitch — James R. Page”), the party transformed Page Court-yard into a neon-lit crash site of pre-millennial nostalgia. A raised DJ platform, painted with monochrome stripes and glowing under blue and magen-ta lights, stood above a packed crowd, pulsing to period-ap-propriate pop and attendant remixes. Page undoubtedly set the tone for the season: loud, chaotic, and unapologetically fun. Y2K survived. So did the dance floor.



Students, as if the end is nigh, dance upon the Page-built platform. (Photos: Jin Park)

ASCIT Board of Directors Meeting Minutes

ASCIT Student Life

November 16th, 2025 | 10pm – 11pm
Hameetman Conference Room

ASCIT Members Present: Ashlyn, Angie, Elisa, Hannah, Bis, Ivy, Parker
IHC Members Present: Isabella, Robert, Dillan, Bram, Joe, Neev, Alanna, Ella, Isara
Please reference IHC Minutes for IHC reports

Joint IHC and ASCIT Concerns
Ashlyn Roice

- CRC
 - Page Social Probation: The intersection between ASCIT and IHC this meeting is due to the CRC changes. Ashlyn had a meeting with Grace Otos, CRC Chair, after Page was put on social probation. CRC was in the process of conducting interviews and collecting information, but Page was put on social probation before the case went through. Working to make sure that, going forward, social sanctions do not happen until a CRC case has fully been processed.
 - Working with Grace to enact a bylaw to involve more students with the CRC.
- REGIS
 - New REGIS policy: Ashlyn is taking questions from house members for REGIS.

Hannah Rose

- Jam Room
 - We were worried that the sound mixer was broken, but we think it works now. Two of the speakers weren’t working during Page Interhouse which we are not sure was the speaker or the

soundboard.

- Houses are looking for a DJ set, so we are figuring out how to accommodate that. Ella: Ricketts needs mics as well.

President’s Report (Ashlyn):

- SWS
 - Met with SWS this week to discuss a wellness event. Ashlyn has two ideas. Number one is an event third-term related to wellness based off of a UCLA event. Number two is to implement wellness challenges like going to the gym daily or drinking a certain amount of water.
- Robert’s Rules of Order
 - Second term we will implement Robert’s Rules of Order to make meetings more efficient.
- Meeting Updates
 - Next term, make meetings weekly rather than biweekly.

V.P. of Academic Affairs (Angie):

- Questionnaire for new REGIS Policy
 - Will be sent out on Friday via Qualtrics. Then Angie will request a meeting with Michelle Effros, Vice Provost to discuss the results of the survey.
- Option Advising
 - May be done the weekend before pre-registration.
- Student Faculty lunch may be pushed back to next term.

V.P. of Non-Academic Affairs (Elisa):

- SLEC
 - All committees are meeting. Only one committee hasn’t submitted research questions. Survey questions are due soon. Upcoming

meeting with Joe to check in.

- VPSA Meeting Follow Up
 - Intend to meet with Joseph Greenwell and Ashlyn. Will check in about the flowchart from admin regarding alcohol violations. Hannah: Heard during PA meeting that the first two infractions, unless something major, will lead to RLC talks. Ashlyn: Need to request more transparency through and at the beginning of the year regarding violations.

Director of Operations (Hannah):

- Club Reimbursements
 - May want to create a Google Form to streamline the process.

Treasurer (Bisrat):

- Ditch Day Funding
 - Hannah: Heard concerns that Ditch Day funding has not been returned to houses yet.
- Screen Printing Room
 - Hannah: Need to figure out how to charge undergrads for the price of the screen printing room.

Social Director (Ivy):

- Event Planning
 - Working with Tom to figure out scheduling for the winter showcase. Settling on \$150 per club.
- ASCIT Formal
 - Working to challenge the date for ASCIT Formal.
- Avery Alternate Inter-house
 - Sign-ups coming soon.

Secretary (Parker):

- Nothing to report

LET YOUR VOICE BE HEARD!

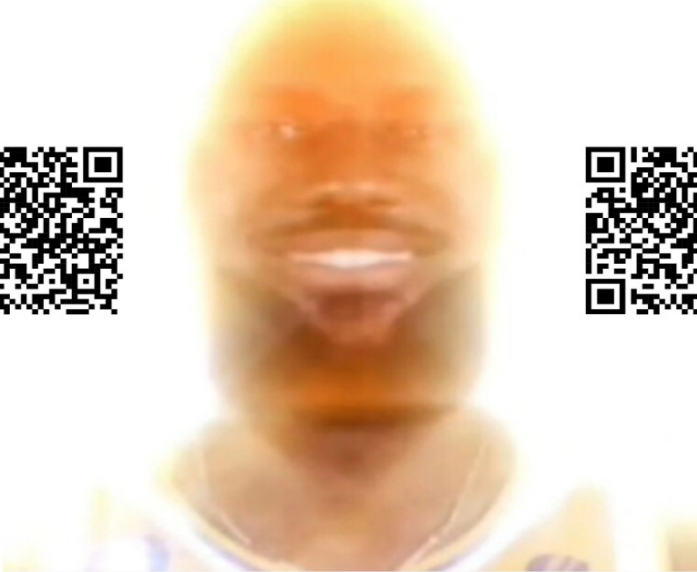
Tell us your opinions about things going on at Caltech with this new survey form on our website! You can submit any time, multiple times, about anything.

THE TECH WANTS TO HEAR FROM YOU!

DO YOU WANT TO WRITE ABOUT SPORTS IN THE TECH?

JOIN OUR TEAM OF WRITERS.

TECH.CALTECH.EDU/WRITE



2025 Pasadena Coffee Passport: Third Round of Reviews

Victoria Davis
Column

Time to review another four Time to review three more coffee shops featured in the 2025 Pasadena Coffee Passport! Last issue, I reviewed Mandarin Coffee Stand, the Boy & the Bear, and Lavender & Honey. This time, I have explored another three coffee shops of the fourteen shops in the passport.

Highlight Coffee

Passport description: “Nestled just above the 210, Highlight is a cozy spot for coffee or tea. Whether you’re the type to get a specialty latte or a single origin pour over, there’s something you’ll love!”

Passport benefit: Half off one drink

This is the furthest coffee place in the passport from Caltech, hence why I had been putting it off. It is about halfway between Caltech and JPL. When I arrived, I decided to try the special Coffee Lemonade, aka “Nathan Palmer,” which is described as “Yup. A coffee lemonade. House-made lemonade with just the right

amount of coffee. Trust us.” I did trust them. It sounded intriguing and fun, so I thought, why not! It was OK.

Sadly, I also bought a pastry that did not pair well with the Coffee Lemonade (but that was my bad). I would have liked to pair this with a savory pastry, but there were only a few pastries in the tiny display case. The same Matcha Donut from Mandarin Coffee Stand was also here at Highlight Coffee! Apparently both coffee shops source their pastries from Sugarbloom Bakery! Since I already tried the Matcha Donut, I decided to try the Chocolate Hazelnut Croissant. (Again, not the best food pairing for my drink, but there were only chocolatey or sugary pastries in the display. Looked like the Everything Croissants and Kimchi SPAM Musubi Croissants were all sold out by 11 AM on a Saturday, though it was fairly empty inside). The Chocolate Hazelnut Croissant was OK. It was very crunch and messy to eat. Halfway through eating it and sipping on my drink, I wished I were instead eating the Tomato, Parmesan, and Cashew Pesto Croissant from the

Boy & the Bear.

Coffee & Plants

Passport description: “Get your camera ready for this Instagrammable shop. This flower-covered café offers entirely plant-based food and drinks. They support an animal sanctuary and sustainability efforts.”

Passport benefit: 10% off

I looked up this coffee shop online and LOVED the aesthetic of it! When I arrived, it was even more cute in person! From the pastries to the drink options, the aesthetics were absolutely on point. The prices, however, were too much. Originally, I planned to buy an egg and cheese croissant, but after seeing that it would cost \$17.50, I decided to get the strawberry croissant instead—which was \$10 cheaper. I also ordered a Rose Bowl Latte. Since the only milk options are almond or oat milk, I went with an Almond Milk Rose Bowl Latte. It was not excellent. It was not good at all. It tasted bland and I couldn’t taste any rose, except for the rose petals that snuck their way into my mouth and did not taste sweet or edible, so I spat them out. It was gross. I

was also shocked that the drink didn’t come in a cup with “Coffee & Plants” written on it. The website features every drink prominently in a cute “Coffee & Plants” pink and gold disposable cup, so I was looking forward to my drink looking just as it does on the website. Sadly, it just came in a generic white paper cup. For the overpriced food and drinks, this was not it. The Strawberry Croissant was okay. It was exactly what you would expect of a croissant with some strawberry jam in it. The aesthetics of it were fun: a dab of strawberry fondant topped with edible gold leaf on a cute pink plate. But it was not worth the price, nor do I think I would go again. Overall, the coffee was not good and the prices were too high.

Jameson Brown Coffee Roasters

Passport description: “Stop by for fresh coffee—roasted daily since 2006—and house-made seasonal and specialty drinks sure to delight your tastebuds. Perfect for enjoying with a friend in their bright and cozy space.”

Passport benefit: 15% off

Right when you enter the door of Jameson Brown, you are hit with the delicious aroma of fresh coffee. The interior and vibe of the place reminded me of the Motley Coffeeshop (a student-run coffeeshop on Scripps College campus where I used to work as an undergrad). I ordered the Mayan Mocha which is a spicy mocha made with chipotle chili, cinnamon, and Valrhona chocolate. It was delicious. With each sip, the spicy chili hits the back of your throat in a delightful way. I paired this with a soft, fresh Bacon Cheddar Pandesal, which cut the spice well and added to the savory experience. The Bacon Cheddar Pandesal was fantastic—soft dough wrapped around cream cheese lined with black pepper on the bottom, and topped with bacon and cheddar. Alternating between drinking my Mayan Mocha and biting the pandesal was heaven. This coffee definitely competes with Mandarin Coffee Stand. I will be coming back to Jameson Brown again—a lot!

Coffee & Plants



Exterior and interior of Coffee & Plants. (Photos: Victoria Davis)



Almond Milk Rose Bowl Latte and Strawberry Croissant by Coffee & Plants. (Photos: Victoria Davis).

Jameson Brown Coffee Roasters



Exterior and interior of Jameson Brown. (Photos: Victoria Davis)



Bacon Cheddar Pandesal and Mayan Mocha by Jameson Brown. (Photos: Victoria Davis)

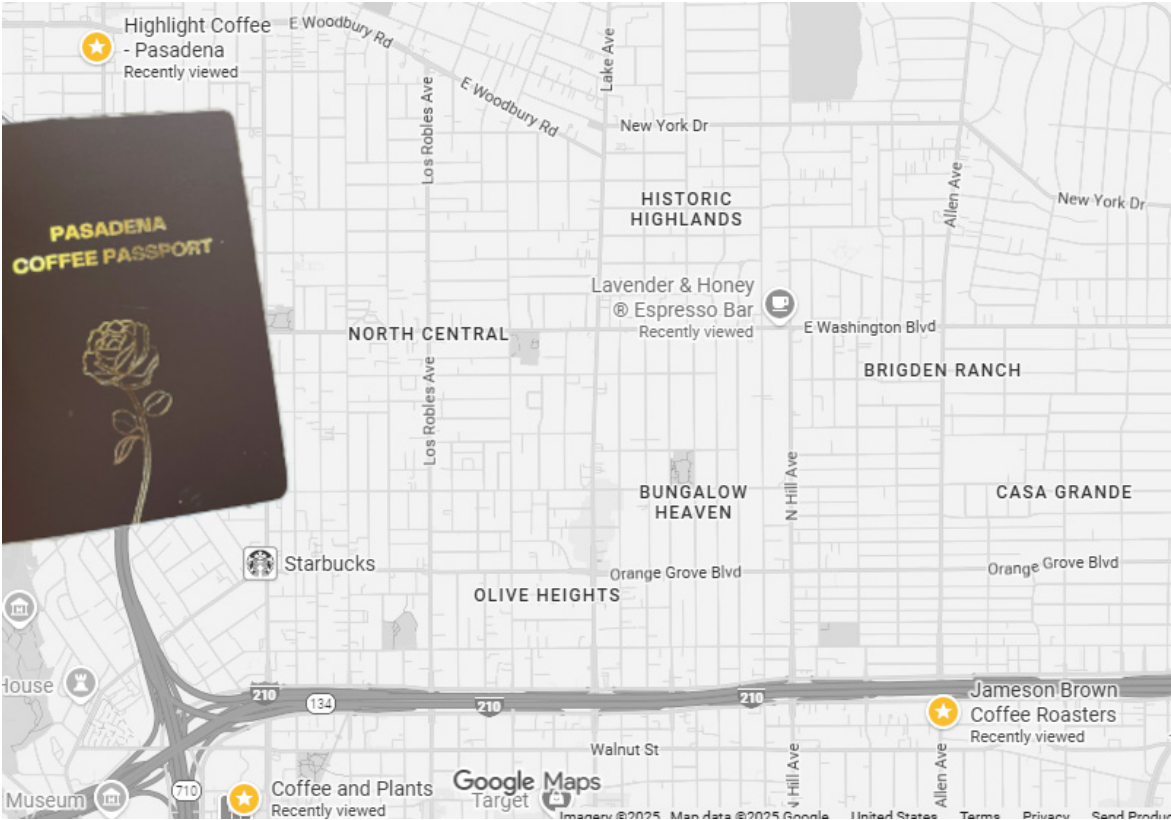
Highlight Coffee



Exterior and interior of Highlight Coffee (Photos: Victoria Davis).



Coffee Lemonade by Highlight Coffee and Chocolate Hazelnut Croissant by Sugarbloom Bakery. (Photos: Victoria Davis)



Integrated Core

continued from page 1

“What’s wrong with Core?”

This fall, Caltech introduced a new first-year track that rethinks how students encounter the Institute’s foundational science curriculum. Instead of taking separate, largely disconnected courses in physics, chemistry, biology, math, and earth science, a small cohort moves through a single, 27-unit block of class organized around one idea: energy.

The program grew out of almost two years of conversations convened by Provost Dave Tirrell and Vice Provost for Education Michelle Effros.

“We were talking about the Core and how to make it more engaging to more students,” Effros recalls. “Some students really appreciate the Core as they’re taking it, and many appreciate it in hindsight. But we wanted to ask: how can we help everyone have the best experience as they’re taking it?”

Faculty across divisions have been noticing two related problems. First, there was “poor retention” of first-year material: students would arrive in upper-level classes having technically passed Ma 1 and Ph 1, for instance, but seemingly unable to recall concepts they’d been tested on only a year or two earlier. Second, says Professor of Geology and Geochemistry Paul Asimow, there was a more intangible loss.

“New Caltech students arrive, and you can see the light in their eyes,” he says. “They’re excited about everything. And by the end of Core, there’s a sense among the faculty that the light goes out. People just do their problem sets each week and lose the excitement.”

One culprit, in the group’s view, was the way traditional Core silos off its components.

“Physics is taught by physicists in isolation from why you’d need to learn physics, chemistry is taught by chemists in isolation from why you’d need chemistry, and so on,” Asimow says. “We wanted to explicitly point out the connections between things and the fact that there is one edifice of science with many pillars. To understand the pillars, you need to step back and see the building.”

Out of that idea came the Integrated Core: a small-cohort, team-taught alternative to standard Core that foregrounds those connections from day one.

Energy, everywhere

Rather than teaching discrete classes that happen to share a roster, Integrated Core is designed as a single, cross-listed course that stretches across three terms. Its unifying theme is energy—chosen because, as Effros puts it, “it’s very of the moment and does a great job of bringing together lots of different disciplines.”

The year for the plan is as follows: Fall uses space travel as a vehicle for mechanics, fuel chemistry, planetary science, and the search for life. Winter shifts to cellular bioenergetics: how organisms obtain, convert, and store energy. Spring turns to carbon capture and climate, linking spectroscopy, geoscience, and policy.

Professor of Physics Gil Refael is responsible for much of the mechanics content in the fall term. He describes the approach as “more or less the same chapters as a standard university physics book—New-

ton’s laws, energy, torque, angular momentum, gravity oscillations—but introduced through the question: How do we actually send things to space?”

The result is a similar sequence of topics, although the problems begin to take on a narrative. How do you design an orbit? Okay, but why *are* orbits closed in a $1/r$ potential? And so, given that, how do you extract enough energy from chemical bonds to lift a rocket out of Earth’s gravity well?

“The emphasis is less on ‘here’s a method’ and more on ‘here’s the calculation we need to do,’” Refael adds. “If you know the energy function, differentiate it, and you get the equations of motion. It’s an almost-Lagrangian way of teaching mechanics that students usually don’t see until much later.”

First-year Maxwell Yu, among the 17 students in the inaugural cohort, appreciates the concreteness.

“I’m definitely more of a practical-minded person,” he says. “I don’t really see myself doing space work in the future, but it’s a good basis for understanding the physics, math, and even geology. I like seeing how things are actually useful in the real world.”

Labs: from termites to rotating chairs

The “integration” is perhaps most visible in the lab and problem-set structure. Each week, students tackle three sets: Set A, math and physics; Set B, biology and chemistry; and Set C, explicitly interdisciplinary problems—often where the earth science resides. Graduate TA Yuri Tamama (GPS) describes Set C as “where geology sneaks in, but it depends on the week. Sometimes it’s more geoscience, sometimes more biochem. The point is that it mixes things.”

The labs follow the same philosophy. In the first two weeks alone, students performed a microscopy lab on the microbiome of a termite hindgut, estimating the power required for a microorganism to swim and converting that to ATP consumption; undertook a series of Fermi estimation exercises to develop intuition for length, time, and energy scales; and conducted a density and spectroscopy lab on magnesium, calcium, and strontium carbonates, linking periodic trends to mineral properties.

Later in the term, physics labs on ballistics and rotational dynamics had students 3D-printing spring-loaded cannons and taking turns on spinning chairs to measure moment of inertia.

“For a lot of us, it was like: first week of college, and we’re already using fancy microscopes,” says Yu. “And it wasn’t just biology. We connected it to physics and chemistry in the same week.”

First-year Delta Blendea, who had experienced a humanities-style integrated curriculum in middle school, says this is exactly what they were hoping for on the STEM side.

“It’s really true that things make a lot more sense when you learn about them in different ways,” Blendea says. “The theme is energy, so when we’re dealing with the minutiae of quantum chemistry, we can relate it back to physics—things want to be at lower potential energy, force is the gradient of potential, and so on. Understanding the same idea across fields makes everything click.”

Humanities in orbit

Integrated Core also features



Photos from the pre-year field trip. Clockwise from top left: Prof. Paul Asimow and company—TA Yuri Tamama riding shotgun—on the road to the Coso geothermal plant, students stand in front of the Earthquake Fault on Mammoth Mountain, and the group poses next to the Crowley Lake Columns. (All photos courtesy of Paul Asimow.)

a year-long humanities component, taught by Professor of English and Dean of Undergraduate Studies Jennifer Jahner. For the fall, Prof. Jahner built her syllabus around the legal and ethical questions of extending human communities beyond Earth.

“I’ve been a scholar of law for years,” she says, “and I’m interested in how communities instantiate law where it didn’t exist before. Space travel is a perfect case study: What does it mean to extend human community into an off-Earth environment?”

The major fall project tasks students to imagine themselves in 2040 as an ethics subcommittee advising the UN Committee on the Peaceful Uses of Outer Space. Working in teams, they draft recommendations for updating the Outer Space Treaty for an era with proposed Martian habitats, tackling topics like property rights, bioethics, resource management, and quality of life.

“We had a really spirited discussion of the Honor Code through virtue ethics, consequentialism, and deontology,” Jahner says. “Part of what I hope to instill is a habit of mind that always looks for the hidden ethical assumptions in a technical project.”

Winter will move students into the Caltech Archives to study the history of hydropower and the growth of Southern California; spring will pivot to Octavia Butler’s *Parable of the Sower*, ideally in collaboration with the Huntington Library, which houses Butler’s papers.

For Integrated Core students, this sequence counts as one of the first-year humanities classes; they still take an additional frosh hum elsewhere in the catalog.



Integrated Core on their field trip to the Huntington, in the tropical greenhouse. (Photo: Paul Asimow)



Prof. Gil Refael lecturing on angular momentum. (Photo: Paul Asimow)

Building a tiny school inside Caltech

Running a 27-unit, three-term block for 17 students is logistically intense. The teaching term currently includes ten faculty: Prof. Asimow (GPS), Prof. Refael and other PMA faculty, Prof. Justin Bois and colleagues from BBE, chemists

from CCE, Professor of Electrical Engineering Glenn George representing EAS, and Prof. Jahner from HHS, along with a small army of TAs spanning divisions.

“We wanted teaching faculty and research faculty in the same room,” Prof. Asimow notes. “It’s not typical for those groups to co-teach, and it’s

been fantastic. The teaching faculty here are really, really good at what they do.”

The group meets weekly—faculty and TAs together—to coordinate lectures, labs, and grading.

Since every week sees new problem sets A, B, and C, the work takes a village. “Someone has to write them, someone has to field-test them, someone has to grade them,” Tamama explains. “It’s interesting being part of building a course from scratch instead of just inheriting old problem sets.”

The TA corps itself is learning as they go. “We’ve had to figure out the balance between recitation, office hours that are general Q&A, and sessions focused on specific problem sets,” Prof. Asimow said. “Many of the TAs are new to TAing, and none of the peer tutors elsewhere on campus have ever taken Integrated Core, so the support structure has to be tailored.”

Even the classroom had to be invented. The Integrated Core cohort currently lives in BBE 1101, a former graduate student lounge reclaimed over the summer. Grad student Jieyu Zhang, who helps run the NeuroTecher group that used to occupy the space, remembers schlepping out couches and inherited furniture.

“Justin [Bois] needs a lounge where professors could work

together all day and TAs could have an office space,” she says. “Our club didn’t really need it, so I moved everything out. Now it’s part classroom, part relaxation area. It’s a really nice space with projectors, whiteboards, and lots of room, and I hope the new students enjoy having it.”

According to Blendea, they do.

“There’s the classroom and a lounge right next to it, and basically at all hours there are a couple of people in there working on a set,” they say. “Pretty much always working together—within the Honor Code. It’s been a really close-knit group.”

Who is Integrated Core for?

The program is explicitly an alternative, not a replacement, for standard Core. It’s also not for everyone.

“You can’t test out of physics or math if you do IC,” Blendea points out. “If you’re planning to place out of a bunch of Core, Integrated Core is not for you.”

Because the 27-unit block already folds in physics, chemistry, biology, earth science, and part of math, students only have room for Ma 1 and maybe one additional class, like CS 1 or Writing 2.

“There’s definitely less flexibility,” Yu says. “For me, it hasn’t been an issue—I wasn’t

planning to take much besides Core anyway—but I’ve heard others struggle with scheduling conflicts. It’s very all-or-nothing.”

The work, students say, is slightly heavier than standard Core in the fall, partly due to the expanded lab component. But the high faculty-to-student ratio makes the load feel manageable.

“There are more hours per week on paper,” Blendea says, “but the smaller size means profs are more willing to hear, ‘This set took way too long,’ and adjust. It was a lot at the beginning; now it feels about on par with everyone else.”

Effros emphasizes that the goal is coexistence, not replacement.

“I see Integrated Core as something that runs in parallel,” she says. “It’s meant to be a small-cohort experience. It doesn’t scale easily to the size of standard Core classes, and not every student will want to take it. But I love the idea of enriching the menu of possibilities.”

She also hopes that what works in Integrated Core will eventually leak back into the rest of the curriculum.

“Bi 1 already offers sections that bring in other fields; Integrated Core is another way to help students see connections right from the beginning. Over

time, I’d love to see multiple integrated tracks organized around different themes.”

A singularly Caltech experiment

For the faculty involved, the pilot has already been very rewarding.

“From a faculty perspective, it’s fantastic,” Asimow says. “We’ve been having enormous fun—going to each other’s lectures, teaching what we want to teach the way we want to teach it, with an enthusiastic, question-asking classroom full of excitement. It’s the teaching we all wish we could do at some point.”

Jahner, who divides her time between dean responsibilities and medieval literature, sees the project as an act of institutional optimism.

“It’s a very Caltech kind of thing to have a grand, complicated plan and just start on it,” she says. “You bring in the people who are excited, figure out how to make it work, then how to make it work a little better. It’s guided by people’s intellectual curiosity and their desire to share what they care about most.”

Prof. Refael frames it in terms of stewardship.

“Caltech is an attractor for a lot of talent,” he says. “We’re entrusted with that talent as a college, so we’re stewards. If

we just teach standard classes in standard ways, that extra Caltech value doesn’t really come out. When we innovate around courses—like Integrated Core—that’s where the character of Caltech professors shows up in our teaching.”

In its first week, Integrated Core shrank from 20 to 17 students as a few opted back into standard Core. The remaining cohort, faculty say, is thriving. The Center for Teaching, Learning, and Outreach will run surveys to gather more surveys to gather more systematic feedback later in the year.

For now, the results are principally anecdotal: clusters of frosh in BBE 1101 late into the night, field-trip photos from geothermal wells and dead forests on Mammoth Mountain, and laughter as first-years contrive absurd Fermi estimates at dinner.

“Everyone at Caltech understands why Core is good,” Blendea says. “Even if you didn’t like it, it’s useful. For the right type of person, Integrated Core just makes that even better.”

Yu agrees.

“It’s clear IC isn’t meant to replace standard Core,” he says. “But I’m glad Caltech is trying it. We’re already seeing lessons they can eventually integrate back into normal Core. And I’m glad I signed up.”

What Makes Caltech Special? A Letter to Caltech’s Incoming President

Jin Park
News

The ‘60s were a wild time. Neil Armstrong set foot on the moon, the Civil Rights Act was signed into law, and members of the counterculture movement were defying traditional social norms. It was an age of innovation, reform, and progress, and Caltech undergraduates had their own contribution to this history: an electric car race. Take a look at the Caltech Archives and you’ll find that by 1968, Wally Rippel (BS ‘68) had modified a Volkswagen bus to an all-electric vehicle and driven it around Pasadena multiple times. Eager to test the endurance of his invention and for an opportunity to proselytize the future of electric vehicles, Rippel challenged MIT to a race in which Caltech would drive to MIT’s campus and MIT would do the reverse.

Though MIT finished first by approximately a day and a half, MIT’s Corvair had broken down multiple times and had to be towed. This led to the accumulation of penalty points on MIT’s behalf and thus Caltech’s victory. But it is not the outcome of this race but rather the scale and audacity of Rippel’s challenge that deserves attention. The infrastructure for charging the electric vehicles was provided by Electric Fuel Propulsion Company, a total of 54 charging stations across U.S. Route 66. While MIT’s car had been built by their electrical engineering department, Caltech’s had been pretty much Rippel’s own project. In 1968, the environmental effects of internal combustion engine vehicles hadn’t been on the consciousness of the general public yet; Rippel had recognized the potential for a

new mode of transportation that has only begun to experience widespread adoption a half decade later.

Rippel would later go on to found AC Propulsion, a company dedicated to building induction motor based drivetrains, with fellow Caltech alumni. According to a former Chief Marketing Officer at Tesla, Martin Eberhard took a test drive in AC Propulsion’s tZero before deciding to build the Tesla Roadster. While AC Propulsion never pursued the commercialization of an electric sports car and instead went back to developing compact vehicles, it was a pioneer that paved the way for future EV companies.

Stories like the Great Electric Car Race of 1968 reminds us of what makes Caltech special. It has to do with detecting gravitational waves on the sextillionth scale or beaming solar power to the earth through microwaves. It’s why Physics X, a seminar class taught by Richard Feynman, could have freshmen throw a question about an apparent violation of relativity and convince a Nobel laureate, even if just for a moment. It’s that character of being unbridled by notions of what’s possible or impossible that is at the core of the Caltech experience.

Often, that kind of free-ranging creativity is directed towards the enrichment of life outside of science. A well documented example is the Rose Bowl Hoax. In 1961, a few Techers were miffed by the fact that the Institute’s football team didn’t get as much attention as other collegiate teams at the Rose Bowl. Plotting for a way to exact justice, a group of Caltech students led by Lyn Hardy (BS ‘62) decided to tamper with the flip-card instructions for the University of Washington.

Here’s how it happened—as it is chronicled in the *L.A. Times*. Hardy, with his group of co-conspirators dubbed the “Fiendish Fourteen,” found out that the band and cheerleaders for the Washington Huskies would be staying at Long Beach State University. Accordingly, Hardy disguised himself as a high school reporter and learned how the flip-card routine would work. After the cheerleaders left for dinner, the Techers picked the lock to the cheerleaders’ room and acquired an instruction card, of which they made 2400 copies.

When the cheerleaders had again left their residence a few days later, members of the Fiendish Fourteen broke in once more. This time, they collected the master instruction sheet and modified parts of it to produce 2232 individual instruction cards. The Techers planted the cards in the cheerleaders’ room and awaited for their plan to execute on its own. The prank went fantastically well. At half time, the card displays went through the first eleven designs as intended by its original creator. Then, aberrations started to emerge. What was supposed to be the Husky mascot looked a lot like a beaver. The word “Washington” was shown backwards. At last, the unmistakable name “CALTECH” was spelled out, for all 30 million viewers at home to behold.

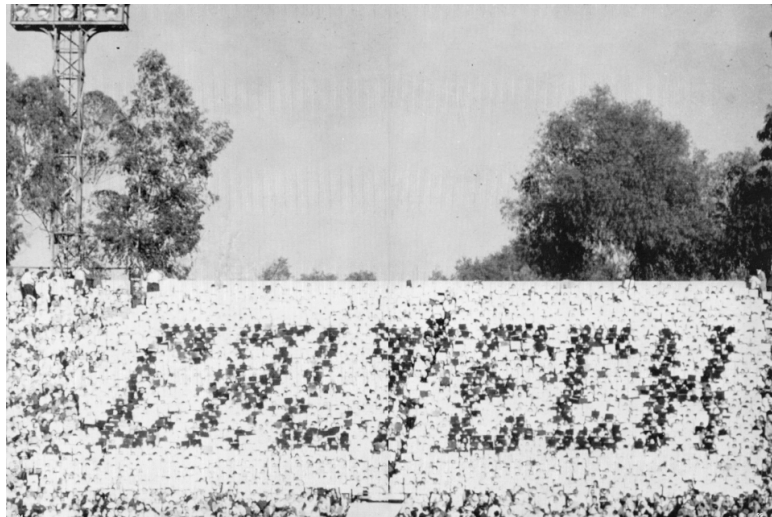
Caltech is hard. And for students to succeed at the Institute, it’s crucial that the administration preserve their autonomy such that there’s enough room for decompression, for blowing off steam. Given the insatiable curiosity of Techers, that sometimes involves (metaphorically) playing with fire. Look at where those mischievous Caltech students of the past

are now. There’s Carver Mead (BS ‘56), inventor of Moore’s

technology. We must preserve this great lineage of thinkers,



Wally Rippel (BS ‘68) and his teammates set out for Cambridge, MA (Credit: Engineering & Science)



A photograph of the hoax in action (Credit: The Big T)

law. There’s Kip Thorne (BS ‘62), eminent general relativity theorist and cofounder of LIGO. Likewise, there is an innumerable amount of Techers who have gone on to shape the world through science and

doers, and builders—and that requires an appreciation for the Caltech culture, with all its idiosyncrasies and mischief.

A Talk with Bill Gates: On Innovation, Sacrifice, and What Really Matters

Camilla Fezzi
Science & Tech

I sat in Beckman Auditorium last night, November 3rd, my iPad open, my pen ready. Around me, students whispered excitedly. Faculty members settled into their seats. The air felt heavy with anticipation—that particular Caltech energy when something important is about to happen.

Bill Gates was coming. I had been looking forward to this for weeks. Not because I'm obsessed with billionaires or tech giants, but because I wanted to gain a deeper understanding. I wanted to hear someone who has spent billions on climate and global health explain how we're supposed to balance it all. How we're supposed to save the world when we can barely save ourselves. The lights dimmed. Applause filled the auditorium. And then he walked on stage.

The Beaver Engineer

He started with a joke about beavers. Our mascot. I smiled—genuinely smiled, which felt rare lately. He explained that beavers are engineers, climate engineers, building dams that store carbon and filter water. “That’s fitting,” he said, “because a lot of the work all of you do will help with the challenges we face with climate.”

I looked around. All of us. He meant me, too. Even though some days I can barely understand my physics problem sets. Even though I spend nights in Kerckhoff—the same building where Dulbeco once worked in a sub-basement—wondering if I belong here at all. But Gates kept talking, and I kept listening.

The Truth About Climate

Then he said something that made the room shift. Something I wasn't expecting. “There are some people who say that climate change is an existential or almost world-ending threat,” he began. I could feel people leaning forward. “Fortunately, although climate’s an extremely serious problem, it’s not of that nature. It will not end civilization.” I heard murmurs. Confusion. Maybe disagreement. But he didn't back down. He explained that while climate change is extremely serious, it won't destroy humanity. It will make parts of Earth difficult to live in. It will threaten human welfare. But it's not, in most locations, the biggest threat to the human condition.

And then he said the thing that's been echoing in my head ever since: “My lens here, and I suggest it should be the lens broadly, is while we reduce temperature increase as much as we can, the real measure is all the things we're doing to help the most vulnerable people on the planet.” Human welfare. Not just temperature targets. Not just emissions. But lives. Actual lives. I wrote that down. Underlined it twice.

Ten Years of Progress (That Nobody Talks About)

Gates reminded us that it's been exactly a decade since the Paris Climate Agreement. Ten years since he launched Breakthrough Energy. And in that

time, something remarkable happened. “A decade ago, if emissions had continued unabated, we were on track for warming above 4 degrees Celsius by the end of the century,” he said. “Now, projected emissions say we're looking at more in the range of 2 to 3 degrees instead of four or even five.”

Wait. What? We cut projected emissions by **40 percent** in ten years? I didn't know that. Nobody talks about that. All we hear is doom, disaster, the world is ending, we're all going to die. But Gates stood there and told us: innovation worked. It's working. Electric vehicles now make up one in four cars sold. Solar and wind costs have plummeted. Battery prices dropped by over 90 percent.

The Green Premium—the extra cost of being clean—has reached zero for some technologies. And when that happens, markets take over. Progress accelerates. “I'm quite optimistic,” he said. I wasn't sure I'd ever heard someone talk about climate that way. With hope. With data. With proof that humans can actually solve problems.

Breakthrough Energy: 150 Companies Building the Future

He walked us through Breakthrough Energy's portfolio—now comprising over 150 companies, working across all five major emission sectors. Electricity. Manufacturing. Agriculture. Transportation. Buildings.

Some of the innovations sounded like science fiction:

- Next-generation nuclear fission reactors for reliable clean power
- Vaccines that prevent cows from burping methane (yes, really)
- New methods of making steel with zero emissions
- Windows that cut building energy use by over 30 percent
- **Space-based solar power**

That last one made me sit up. Gates said he met with Caltech's team today—the one working on the solar space-based power demonstrator. He admitted he thought it was science fiction. But after meeting them, he said, “It sounds like they are right on track, which would be a fantastic contribution.”

I study in Kerckhoff. I walk past those labs. And suddenly I realized: I'm surrounded by people building the future. Right here. Right now. Maybe even me.

The Part Nobody Wants to Hear

But then Gates shifted. His voice got quieter, more serious. He discussed the other aspect of his work: global health. The Gates Foundation. Vaccines. Malaria. HIV. Child survival. And he told us something heartbreaking. “This will be the first year that childhood deaths goes up in a long time.” Up. Not down. After decades of progress—cutting childhood deaths in half since 2000—they're going up again. Why? Because aid budgets are being cut. Rich countries spend less than 1% of their budgets helping poor countries, and that number is **dropping**. Money

for childhood vaccines? Down dramatically. Malaria bed nets? Down. HIV medicines? Down. “Those things will result in millions of deaths,” Gates said, “until we can get them reversed.” I thought about my own struggles. My exhaustion. The nights I can't sleep. The pressure. The fear of failing. And then I thought about a child in Nigeria who might not get a vaccine because funding was cut. Perspective is a strange, uncomfortable thing.

The Trade-Offs We Shouldn't Have To Make

Gates explained that with limited resources labeled for helping poor countries, we're forced to make impossible trade-offs. Climate adaptation versus vaccines. Solar panels versus malaria nets. “To be clear,” he said, “we're having to take very limited resources and make trade-offs that we shouldn't have to.” His memo—the one that went viral last week, the one everyone has been arguing about—was intended to explain this. He wasn't saying climate doesn't matter. He was saying: with the money we have, how do we save the most lives? And the answer surprised me.

Prosperity IS Adaptation

The University of Chicago's Climate Impact Lab ran a study. They asked: what happens to climate-related deaths if poor countries experience economic growth? The University of Chicago's Climate Impact Lab conducted a study. They asked: what happens to climate-related deaths if poor countries experience economic growth? The deaths drop by more than 50 percent. Prosperity itself is climate adaptation. When people have money, they can afford air conditioning during heat waves. Better housing during storms. More resilient food systems during droughts. “Deaths from weather disasters go down dramatically as countries get better off,” Gates explained. “The economic cost becomes completely absorbable.” So the question isn't just: how do we stop climate change? It's: how do we help people **survive** climate change while we're working on stopping it? And the answer, Gates argued, is agriculture, health, and energy.

Seeds That Save Lives

Gates talked about agriculture with the same passion I heard when he discussed semiconductors or AI. Most of the world's poorest people are subsistence farmers—working on two to four acres, earning about \$2 a day, with no safety net. A single drought or flood wipes them out for an entire season. But innovation is changing that. In Nigeria, drought-resistant maize varieties are boosting output by **over 50 percent**. That's enough to feed a family for a year and still have crops left to sell—five months' worth of income. In India, AI-powered text messages warning farmers about monsoon timing saved **a million acres of crops** last year. And Caltech researchers



helped make those predictions. Caltech. Us. This place. “Our goal,” Gates said, “is to have the advice for the poorest farmer in the world better than the advice that the richest farmer has today.” Artificial intelligence. Not for chatbots or generating papers. But for helping a farmer in sub-Saharan Africa know when to plant. What seeds to use. How to deal with plant diseases. That's what innovation should do.

The Conversation: Defending Nuance in a Polarized World

After his talk, Gates sat down with Amy Harder from Axios. She asked about his memo—the one that sparked global controversy. “Who here has read all 17 pages?” she asked the audience. Some hands went up. Not many. I had read it. All of it. Because I wanted to understand. The criticism came from all sides. Climate activists said he was backing away from climate action. Climate deniers claimed he was admitting they were right. President Trump even posted about it, declaring victory. Gates looked exhausted for a moment. Then he responded: “A gigantic misreading of the memo.” He explained—slowly, carefully, as if he were teaching—that his funding for mitigation is increasing. His funding for adaptation is going **up**. His funding for global health is going **up**.

He has \$200 billion. That's what he's committing over the next 20 years to these three causes. And it's not enough. It will never be enough. “I'm going to run out of money in 20 years,” he said matter-of-factly. Climate scientist Katharine Hayhoe suggested framing climate not as its own “bucket” but as a hole in all other buckets—affecting hunger, disease, malnutrition. Gates pushed back. “If you can't map to dollars per ton avoided, then what is it? Religion?” His voice was sharp. “This is a numeric game in a world with very finite resources.” And I understood. He wasn't being cold. He was being honest. When you have limited money and unlimited suffering, you can't just say “everything matters equally.” You have to calculate. Measure. Decide. It's brutal. But it's necessary.

The Question About Geo-engineering

Someone asked about geo-engineering—technologies that could temporarily adjust global

temperatures by putting particles in the atmosphere. Gates admitted he's funded research on it. Not because he wants to use it. However, if we reach a tipping point—if positive feedback loops start accelerating warming beyond our control—we need to know if we have options. “You have to have a principle of extreme caution about using those things,” he said. But knowledge matters. Understanding matters. Even of scary things. I thought about my own fears. The ones I carry. The ones that wake me at 3 a.m. Sometimes you need to study the thing you're afraid of. Not to use it. But to know.

The Challenge to Us

Gates ended by speaking directly to us. The students. The researchers. The future. “This campus has an extraordinary track record—Nobel laureates, NASA missions, breakthroughs that reshape entire fields,” he said. “I challenge you to think broadly about what we need to get done. How we direct our innovation, given the values we have and the priorities we have.” Then he said something I'll remember for a long time: “I'm a climate activist, but I'm also a child survival activist. And I hope you will be too. That's the best way to make sure that everyone gets a chance to live a healthy life, no matter where they're born or what climate they're born into.” He paused. “We know the challenges—make clean everything cheaper, make farmers more resilient, keep people healthy, help educate people. We don't yet know who will invent the solutions, but I bet some of you are sitting in this room.” The applause was long. Standing ovation. I stood too, my notebook pressed against my chest.

What I'm Still Thinking About

Walking back to my dorm, the night air cool against my face, I kept replaying his words. We don't yet know who will invent the solutions, but I bet some of you are sitting in this room. I think about my own failures. The times I've fallen—literally, in the sand with my horse, and metaphorically, in classes that broke me. The times I pushed too hard and broke myself. But Gates didn't just talk about success. He talked about trade-offs. About limited resources. About making impossible choices. He emphasized the importance of doing what you can with what you have. And maybe that's the lesson.

Not perfection. Not doing everything. But doing something. Measuring impact. Choosing carefully. Working on problems that matter.

There are 150 Breakthrough Energy companies. But there could be 1,500. Or 15,000.

There are Caltech researchers predicting monsoons and developing drought-resistant crops. But there could be more.

There are people like Renato Dulbecco—my inspiration, my predecessor—who came from Italy after the war, who worked in a sub-basement at Kerckhoff, and invented methods that changed biology forever.

And maybe, just maybe, some of us in that auditorium will do something that matters too.

Not because we're geniuses. Not because we're perfect. But because we're here. Because we have the tools. Because someone like Bill Gates stood on that stage and told us: you can do this.

We **have** to do this.

What Human Welfare Really Means

The thing I keep coming back to is this: Gates never separated climate from humanity. He never said "choose one or the other." He said: measure everything by how it affects lives.

Lives.

Not emissions targets. Not temperature goals. Not abstract numbers on a graph.

Actual human beings. Chil-

dren who might not get vaccines. Farmers whose crops might fail. Families displaced by floods.

And I think about my own life. The pressure I put on myself. The way I measure my worth by grades, achievements, whether I'm "enough."

But what if the measure isn't perfection? What if it's just: did I help? Did I make something better? Did I use my resources—limited as they are—to reduce suffering?

Maybe that's what we're supposed to do here. Not save the entire world alone. Not solve everything. But find one problem, one innovation, one life we can improve.

And then do it.

Hic et Nunc

Live in the present. Here and now.

That's what I tell myself when the panic sets in. When the deadlines pile up. When I can't breathe.

But last night, listening to Bill Gates, I realized "here and now" doesn't just mean surviving my own life. It means recognizing that right now, somewhere, a child is dying of malaria. Right now, a farmer is watching their crops fail. Right now, the climate is changing.

And right now, in labs and classrooms across this campus, people are working on solutions.

I'm not sure if I'll be one of them. I'm unsure whether I'll invent the next breakthrough or just scrape by with passing grades.

But I was in that room. I heard him speak. I took notes. I understood.

And perhaps that's enough to get started.

Thank you, Dr. Gates. Thank you, Caltech. Thank you to everyone working on problems bigger than themselves.**

I'll do my best to make you proud.

Camilla

The science of thought: philosophical insights into scientific practice

A Letter to Future Generations: On the Philosophy of Happiness—Part I: Unhappiness

Written with love and wisdom gained through years of seeking... and I am still doing this

Camilla Fezzi
Inner Voices

Hey there, younger teenager, I know you're probably sitting in your dorm room right now, stressed about midterms, wondering if you picked the right major, scrolling through Instagram and feeling like everyone else is happy and has their life figured out except you. Spoiler alert: they don't. But more importantly, that anxious knot in your stomach—that constant feeling that happiness is just around the corner, waiting for you after the next exam, the next internship, the next relationship—that's exactly what I need to talk to you about.

I'm not going to lie and say I have all the answers now. But what I do have is perspective, and a lot of late-night conversations with dead philosophers who've been wrestling with the same question that's keeping you up at 2 AM: *What the hell is happiness, and why does it feel so impossible to hold onto?*

You're taking that Philosophy class right now (or you will be soon), and honestly? Those ancient dudes and modern thinkers you're reading aren't just academic exercises. They're survival guides. They've mapped out the territory you're stumbling through in the dark. So let me share what I've learned from them—not as some abstract theory, but as actual, practical wisdom that might save you from some of the mistakes I made.

The Instagram Illusion: Why Pleasure ≠ Happiness

First things first: let's talk about what happiness is *not*. And this is going to sting a little because you're currently chasing all the wrong things. I know

you think that getting into that competitive program, landing that internship, going to those competitions, buying those new sneakers, or getting validation from that person you're into is going to make you happy. It won't. At least not in the way you think.

Look around campus. Everyone's curating their perfect life on social media—the beach trips, the late-night study sessions that look aesthetic, the friend groups that seem effortlessly close. What you're not seeing is the anxiety attacks in the library bathroom, the loneliness at 1 AM, the constant comparison and self-doubt. That's because we've all been sold the same lie: that happiness is a collection of perfect moments and shiny achievements.

"Happiness is not pleasure, but the absence of pain; not ecstasy, but peace."

— Epicurus (341-270 BCE)

Here's where Epicurus comes in clutch—and no, he's not just about "eat, drink, and be merry" like people think. This guy from 300 BCE actually had Instagram figured out before Instagram existed. He said there are two types of pleasure: the quick hit (kinetic pleasure) and the sustained contentment (katastematic pleasure). Think about it like this:

Kinetic pleasure is that rush when you get 200 likes on a post, when you hook up with someone at a party, when you buy something new, when you ace a test you crammed for. It feels *amazing*... for about twenty minutes. Then it fades, and you're already looking for the next hit.

Katastematic pleasure—what Epicurus called *ataraxia* (basically, peace of mind)—is that feeling when you're sitting with



your real friends, no phones out, just talking. Or when you're working on a project you actually care about and you lose track of time. Or when you're alone on a Tuesday night, not doing anything special, and you realize you're... okay. More than okay. Content.

I'm not going to pretend I didn't chase the kinetic stuff. You will too. You're going to buy things that don't make you happy, pursue people who aren't right for you, and spend way too much energy trying to impress people you don't even like. That's part of being in your twenties. But the sooner you realize that these thrills are junk food for the soul—temporarily satisfying but ultimately leaving you emptier than before—the sooner you can start building something real.

The Hedonic Treadmill (Or: Why Getting What You Want Doesn't Fix You)

There's this concept in psychology called the hedonic treadmill, and it's going to explain so much of your disappointment. Basically, we adapt to everything. You finally get into your dream school—amazing for a week, then it's just... where you go. You land that competitive internship—incredible for a month, then it's just... your job. You start dating that person you were obsessed with—exhilarating for a few months, then relationship maintenance.

Studies show that lottery winners return to their baseline happiness level within a year. *A year.* Let that sink in. If winning millions of dollars only makes you happier for twelve

months, what chance does getting an A in Organic Chemistry have? This isn't pessimism—it's liberation. It means you can stop believing the lie that your happiness is waiting for you on the other side of achievement. It's not. It never was.

"Very little is needed to make a happy life; it is all within yourself, in your way of thinking."

— Marcus Aurelius (121-180 CE)

So, how can you escape this treadmill? Find out in the next installment of this special philosophy-of-happiness series!

An Overdue Conversation with Tom Mannion, Caltech's Cornerstone of Student Life

Damian R. Wilson
The Inside World

Senior Director for Campus Activities and Alumni Engagement, Tom Mannion, has been a fixture of Caltech life since 1993. His name is synonymous with many of the Institute's most cherished traditions: House dinners, Cooking 101, the Olive Harvest, and the vibrancy of student life. To learn more about Tom's myriad contributions to this campus (and check off a dusty *Tech* to-do list item), I recently sat down with him for an interview.

Thanks for your time, Tom! How did you end up at Caltech?

In October of 1993, a job search firm found me and asked me to apply. They were recruiting for the Manager (now Director) of Housing. At the time, I had been at George Washington University, where I did undergrad and grad work and served as student body president. We did cool stuff in student government, so the university kept hiring me to do things, and I got really into Residential Life and Housing.

I was really active on the facilities side, and as an area coordinator, and as an assistant general manager, running lots of RAs, and staff, and I advised the residence hall government (which is like the IHC here). Residence Hall government was part of a national organization, and we were selected School of the Year, nationally, and I was Advisor of the Year for the North Atlantic Organization. I sort of got a name in those circles!

I decided to move on to West Virginia for a company that designed, built, and managed private housing and food, an actual for-profit that I don't even know exists anymore. I then moved to West Virginia to manage private housing and dining in Morgantown. A couple months in, Caltech called. I hadn't even heard of it, but the interview was almost all undergrads, who asked things like, "What would you do if a couch were thrown out of a window on the Olive Walk?" I loved the spirited interview..

Pasadena wasn't what I expected California to be—mountains, East Coast-like architecture. I was flown back to West Virginia, got the offer, and was asked to start in two weeks. Given my personality of being spontaneous, I said yes, packed a suitcase, and they handled the rest—even shipped my trash can, paper towel included.

Caltech was that active in the moving process?

They shipped everything, paid for everything—the shift was totally transparent. I went out here, and all my stuff eventually followed. They even kept my trash can and wrapped the dirty paper towel at the bottom.

And what were those first few months on the job like?

Everybody was fighting with each other when I arrived, so I had everyone take the Myers-Briggs instrument and used the results to physically shift people around to more comfortable personal space.. Undergrad and grad housing were separate units—I combined them, and we later added faculty housing. Back then, housing

reported to business, not student affairs. It was going well, but it was stressful.

My first day, I thought people were burning leaves—it was the massive Altadena fire. Three months later, the Northridge earthquake hit at 4:31 a.m. I threw on a suit and came to work. I'd never experienced an earthquake, but people appreciated how fast I showed up. Between fires, quakes, and mudslides, it was a rocky start. After that, Caltech took me off probation, probably afraid I'd quit.

Then-President Tom Everhart called about fixing childcare, which I didn't realize had become my job after my bosses left unexpectedly. It was a community forward venter that did not give enough priority to Caltech families. Over a few tense years we were able to turn it into a center for almost exclusively Caltech families. Two of President Everhart's biggest concerns were childcare and student food—things a president shouldn't be stuck dealing with with all of the time. Around then, I decided to ditch our dining contractor (which cost hundreds of thousands and made little money) and create Caltech Dining Services.



The Winnett Student Center in the 1960s. Once home to Mannion's technical bookstore, the building was demolished in 2017 and replaced by the Hammetman Center. (Photo: Caltech Archives)

Around the same time—this all blurs—Student Affairs tried outsourcing the bookstore. Faculty rebelled. Kip Thorne chaired the committee, and we fought to keep it internal. The task given was to create a world class technical bookstore Amazon had just started; they only sold technical books then. I remember Steve Koonin sang the virtues of Amazon, but others really knew nothing about it. We renovated Winnett—which looked like a paddleboat to me—and moved the Red Door café there. We built Caltech Wired, a great computer store.

I also picked up graphic arts/mail services and started renovating JPL dining, where a bigger contract combined with campus meant less expensive and thus better food. Professor Bellan, leading the Admissions Committee asked to expand dining options for admitted students, and we followed through—kosher kitchen, halal kitchen, the works. This was all motivated by the motto: *Nothing that I do or won't do will be the reason someone doesn't come to Caltech.* That was our mantra.

Good mantra.

I started developing very good relationships around food. David Baltimore and I worked together on a place called the (Frank) Capra Retreat, but development encroached on it, and it wasn't very usable. Around the same time, the campus was in open revolt over a proposed Rich-

ard Serra piece. Baltimore said, "What would it take for that not to happen?" I said (actually kidding), "A million dollars for a retreat fund." So now we have a million-dollar retreat fund that pays for students to go on overnight group retreats—the original purpose of the Capra site.

How did life change across different administrations?

I've had something like 13 bosses in my first five years here, just bouncing all over the place. Everhart left, Baltimore came in. I'd grown up in Swarthmore, and he'd gone to school there—standard greeting is "Peace," Quaker-style, so we'd flash the peace sign at each other. At one Caltech event, I handed him a bottle of Francis Ford Coppola wine, and he said, "Francis and I played tuba together in high school." Turns out they were in the same tuba section in Great Neck, Long Island. Small world.

Avery House was a different kind of project—it wasn't about beds so much as a new model. We opened a building whose revenue didn't even cover the debt service. Most of the rest of my housing portfolio—especially grad housing—was already paid off. Avery changed that; suddenly, undergrad housing wasn't "free" of debt anymore.

The funniest Avery moment: I sat in a construction meeting and saw card readers drawn in everywhere—on doors, in the dining hall, you'd just "swipe" and pay. But our ID cards were just laminated photos. At GW, I'd helped pioneer mag-stripe cards for Domino's and such, so I said, "What's the system?" Blank looks. You can't just bolt readers to the wall—you need programmers, data flowing into POS, security.

We ended up spending several hundred thousand dollars on a proper card office, equipment to make new IDs, readers campus-wide, and POS systems that could actually take the card. It completely transformed how we did business. Before that, everything was honor code, all-you-can-eat lunches and dinners.

It changed the way we feed you guys. Before, you ate cafeteria-style in your House for lunch; students always asked, "Why can't we eat at Chandler?" It's so much better than House food." So we brought Chandler-style dishes into dinner, developed vegan, kosher, and halal programs, and eventually got ranked top ten by the Physicians Committee for Responsible Medicine. The holdout was lunch—students didn't want to give up House lunches. The ID card finally let me sell declining balance as part of the board: you could now "spend" your plan at Chandler, Red Door, wherever. That opened the door to everything.

We would have had to do it eventually, but Avery forced us to do it immediately. When Everhart took the first swipe, I proudly showed him the reader...and it didn't have power. So we had a learning curve.

When Avery opened, it wasn't an undergrad house; undergrads were the majority, but there were 30-some grad spaces and some faculty spaces. Gary Lorden called it "the Athenaeum for the rest of us," and the outside courtyard was meant to be like that for peo-



Tom Mannion (left) and the much-beloved Davey (right). (Photo: YouTube)

ple who weren't Ath members. That's why the building and that courtyard are gated separately. For lunch, we weren't allowed to take cash—only cards. We built a tandoori station, a high-end Chinese wok, sandwiches, salads—India and China were a big focus.

Gary's idea was that nobody could live in Avery for more than a year, and you had to interview to get in. I had to laugh; demand was never that high. Blacker people sort of formed a "Blacker alley" inside Avery, but they were just students living there—Blacker didn't control it. Grads weren't crazy about it either because you had to be on board.

Eventually, the faculty voted to make Avery a House. It was conceived as an entrepreneurship model: entrepreneur-in-residence, guest apartments where artists or founders would live and teach for a term. R. Stanton Avery became a good friend. He gave \$6 million of the \$16 million cost—enough for the naming. He'd call when he came to campus; he could still drive but had trouble walking, so I'd get to sit and hear his stories. The abacus in the Avery museum? He claimed the first "innovation" in thousands of years was using a piece of toothbrush as a decimal point.

Stan was wonderful. His wife, Ernestine D. Richter Onderdonk Avery, was too—she passed unexpectedly. He told me that at Pomona, he once lived in a converted chicken coop. Eventually, he became chair of the Caltech Board.

Didn't realize he was so powerful.

He confided in me, when starting his business Avery Dennison Corporation, and Dennison had been aggressively trying to put him out of business and he acquired Dennison eventually and the name, Avery Denison, and the Dennison in the name offended him: the one thing to do before he died was to take the Denison off Avery Denison and never got around to that as far as I know.

Under David Baltimore, a report was issued to evaluate student affairs, quality of life report, or some such thing, and recommended we hire a full-time Vice President of Student Affairs. Around that time. I started being given a lot of student life stuff to try to make students happier, we had a horrible problem where students were always discontented, and alumni reports were always bad.

So we created Campus Life as the overriding department: campus, dining, childcare, and student activities. They ended up moving me to 400 S. Hill in a place where I could start a cooking class and become part of the residential living program, which was what they wanted, and was a place where

we did our own programming, manners dinners, and cooking classes.

Manners dinners?

The donor, James Crawford, gave money and we worked together to create wine and food pairings, and manners dinners. Master of Student Houses of was a faculty live in position that I partnered very closely with. I ended up absorbing a lot of the programming stuff they did over time, working with some of the MOSHes there. (MOSH was a precursor to Residence Life; they used to be in charge of the RAs, discipline, everything. When Residence Life was created the [position became more of a pure link between academic and House life])

We had over 15,000 visits to that house a year for programming. It could be as much as the entire freshman class for dinner, 500 people for a Meat Club—

Sorry, Meat Club?



An open grill night at Meat Club (top) and the chaos of meal prep for a Sunday open dinner (bottom). (Photos courtesy of Tom Mannion.)

Meat Club was huge for a while—open grill nights with different charcoals where you cooked your own meat. I also hosted Sunday dinners for 300–400 people—GoT, football, whatever. Folks helped cook and clean. It was cooperative.

That all started under Margo Marshak, our first professional VPSA, who really shaped what I do—along with David Baltimore. Student complaints about the quality of life were constant, but things started to improve. Alumni satisfaction went up.

When Jean-Lou became president—Bob Grubbs told me, "You'll like this guy"—he immediately connected with

A photograph of a park area. In the foreground, a paved path leads towards a playground. On the left side of the path, there are two green trash bins. A person in an orange shirt is walking on the path. In the background, there is a playground structure with a slide, surrounded by large, leafy trees. A brick wall and a grassy area are visible on the right side of the path.



Manners dinners, cooking, having faculty attend—I think that's been huge. Students see professors as people, and even as role models. That's what it's



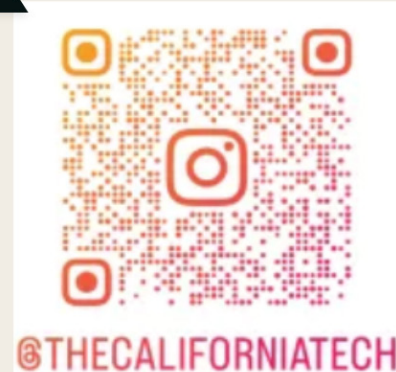
Anyway, Student Life got too big, so we brought in Peter Daily—he'd run food at Santa Anita

This has been quite the far-ranging conversation. You have quite the history!

This interview has been edited for length and clarity.

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In any remaining absence of clarity, the Honor Code is the guiding principle.

The California Tech

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The California Tech #28 CalGuesser



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TECH EDITOR'S CORNER

Bonus content totally disconnected from any current events. From your favorite *Tech* editors <3



Arnold Böcklin, *Isle of the Dead*, 1883
Alte Nationalgalerie, Berlin, Germany

“Linus Pauling once wrote that science is a search for truth, but the man who taught me the most about the search for truth was not a scientist. His name was Richard Kipling. I am only one of hundreds whose search has been shaped by Richard. I am only one of hundreds that miss him dearly.”
- Cristian Ponce (BE, Blacker)

The Thing Is

BY ELLEN BASS

to love life, to love it even
when you have no stomach for it
and everything you've held dear
crumbles like burnt paper in your hands,
your throat filled with the silt of it.
When grief sits with you, its tropical heat
thickening the air, heavy as water
more fit for gills than lungs;
when grief weights you down like your own flesh
only more of it, an obesity of grief,
you think, *How can a body withstand this?*
Then you hold life like a face
between your palms, a plain face,
no charming smile, no violet eyes,
and you say, yes, I will take you
I will love you, again.

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