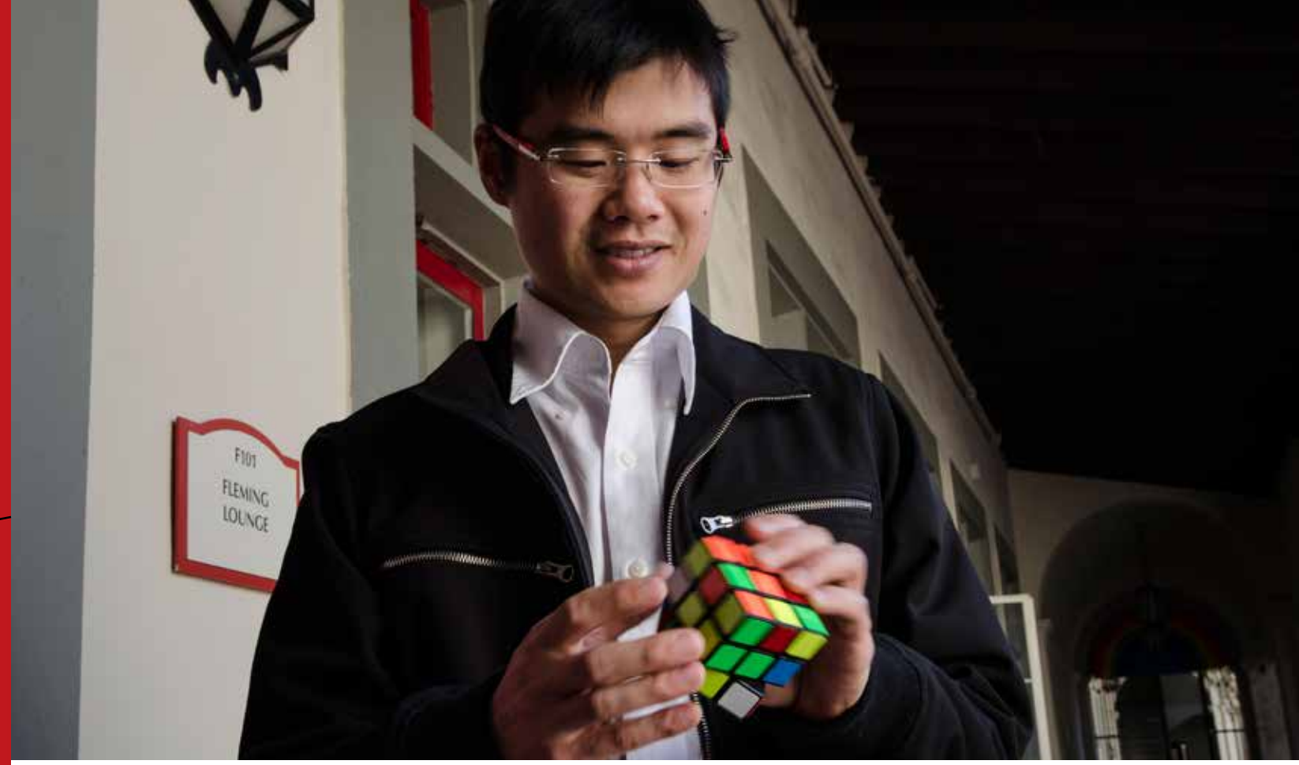
THE STARTING LINE

The college years often skew the path we expect to follow, creating new routes to unexpected places, relationships, careers, and passions. They are, in oh-so-many ways, the beginning of our lives as adults. They provide the origins of our own personal stories.

That is why, in this issue's Endnotes (see page 36), we asked Caltech's alumni what it was that started for them here during those transformative years. We received so many fascinating and surprising answers that we couldn't possibly fit them all on one page; in addition, some were stories that needed more room to be fully told. And so, here, we've given that room to just a few of those stories.



A CUBE COMPETITION

The summer between my freshman and sophomore years, my brother learned to solve a Rubik's Cube. After a two-hour teaching session, I too could solve the Rubik's Cube—in 10 minutes and with a sheet of notes. I became quite dedicated during my sophomore year, to the detriment of my Ph 12a final exam, and practiced more hours than I should have to bring those 10 minutes down to 30 seconds.

Soon, my housemates in Fleming had joined me in my new hobby—Mithun Diwakar (BS '06) and Mark Polinkovsky (BS '06) were particularly involved—and the Rubik's Cube craze spread to other communities at Caltech. I played violin in the Caltech orchestra, and fellow musicians Leyan Lo (BS '07) and Shelley Chang (BS '07) quickly became hooked on the cube as well. We had all become "speed cubers"—poor souls addicted to the art of solving the Rubik's Cube faster. With the help of Mithun and Mark, I used Caltech's friendly room reservation system to book Winnett Lounge for Pasadena's first local Rubik's Cube competition, held on January 24, 2004. Our winter competition led to a spring competition. Through that event, I connected with Ron van Bruchem, a cuber in the Netherlands, and the World Cube Association was born. By standardizing the regulations and process, we made it possible for people from all over the world to compare times.

I eventually went on to host the United States national championship in 2004. The team at Caltech, which started with my friends, has organized every national championship in the United States as well as the World Rubik's Cube Championship 2013.

Today, the World Cube Association includes competitors from all six continents; tens of thousands of these cubers travel to WCA events every year. I graduated from Caltech in 2006 and was fortunate enough to have the foresight to find my successor by tricking Daniel Lo (BS '09) into leading the Caltech club. He eventually passed the torch on to Ambie Valdés (BS '10) and Michael Young (BS '14).

The impact of the Rubik's Cube on my life has been incredible. As I wrote the previous paragraph, I realized that what started for me at Caltech has also led to my gaining a sister-in-law. My brother, who taught me how to solve the Rubik's Cube, is now engaged to Ambie, whom he met through me. They plan to marry next year.

It all started for me at Caltech. Caltech had a wonderful community of people who were willing to not only put up with my addiction but to also nurture it. At Caltech, my impulses and my ideas became many things. They became an international organization, they became lifelong friendships, and they became my family.

—Tyson Mao, BS '06

A PASSION FOR STATS

Unusual for Caltech, what started for me was a career in sports, one that now has me in the front office of the Sacramento Kings. In the last years of high school, the annual *Bill James Baseball Abstract* was my link between sports and numbers. Those books had me thinking when I entered Tech about how to scientifically break down sports using statistics. In my freshman year, math professor Gary Lorden showed me how James calculated the chances that the Detroit Tigers would have a 36-4 record after 40 games given their previous performance. Conversations with my freshman adviser, Peter Haff, about the physics and statistics of basketball encouraged me to apply what I was learning at Tech to sports.

And so, as finals wound down in my freshman year, I decided to systematically chart the NBA Finals that were occurring at the same time. The system I developed would ultimately form the basis for much of the basketball analytics that are now used across the NBA and for college basketball.

In my sophomore year, Caltech hired longtime Mt. San Antonio College coach Gene Victor to coach the basketball team—and I found another person to talk basketball with. Entering my junior year, I showed Coach Victor some of the work I had done, and he encouraged me to work with and join his coaching staff—maybe because I wasn't a great player.

My friends at Tech weren't all sports fans, but they appreciated the science behind what I was doing. Being able to talk basketball to scientists and science to basketball people helped build the language of sports analytics.

For graduate school, I turned down MIT, Stanford, and Harvard to go to the University of North Carolina, which had both a great basketball team and a great environmental engineering program. Coach Victor put me in touch with Bill Bertka, assistant coach of the Los Angeles Lakers, so that I could work as an advance scout in North Carolina. Four years later, I had a PhD in engineering and a lot of basketball experience.

At the time—1994—there was no market for what would eventually be called "basketball analytics." There *was* a market for environmental consulting, so that's what paid the bills. Then, in 2002, Michael Lewis sat down to write *Moneyball*, the story of how the Oakland A's used analytics to win in baseball. At the same time, I took time off from consulting to write *Basketball on Paper*, a book on how to use analytics to win in basketball. The coincidental timing encouraged me to quit my job and take a chance at getting into the NBA.

That was 2004. Since then, I've been to the NBA Conference Finals, worked with Hall of Famers like Magic Johnson and Chris Mullin, helped build the sports analytics industry, and made sure to stay in touch with the friends and coach from Caltech who helped get me here.

—Dean Oliver, BS '90

A PLACE TO GATHER

When I visit Caltech and see the Red Door Café, I am proud to remember helping to get it started. Costas Synolakis (BS '78, MS '79, PhD '86) suggested the idea of creating a grad-student coffeehouse in the first place. The late L. Bruce Kahl, MD, then the head of Counseling Services, agreed that grad students needed a place to meet. Astrid Howard (MS '83) came up with the great name. Morgan Gopnik (MS '82) did more of the work than anyone else, including painting the door red. As for me, my role was to get the project off the ground: once we had a committee together, I got the permission and the money to get the coffeehouse started. I also remember buying the first, home-level espresso machine—and then its replacement restaurant-grade model.

It all started on the second floor of Winnett, which had a few student offices, the Caltech Y, and two meeting rooms. We somehow negotiated to get an office next to a meeting room, and a split door was put in between the two, along with a service counter. I still remember vividly when Astrid suggested that we paint the door red. That was not too well received, but then she added if we did that we could call it the Red Door Café. Everyone liked that, and the name was set.

In the beginning, you could get coffee, tea, and hot chocolate, as well as homemade desserts. We had some paid staffing, but most counter duty was handled by volunteers.

The Red Door was a place that grad students hung out at; it was sometimes visited by undergrads but not very much by faculty. Before it got started, grad students only tended to know the other students in their department. This was one small way that grad students could meet outside of their direct professional activities, and I think it was helpful in making Caltech a more human place for us.

—Brian Toby, PhD '87

A DANCE TO REMEMBER

I met my future wife on a blind date to a Ricketts House barn dance in my sophomore year, arranged by classmate Bill Graham (BS '59). We became engaged in the middle of our senior year (she was a student at Pomona), and we married the evening I received my BS in physics from Caltech: June 12, 1959. I also was commissioned into the Air Force Reserve at the graduation ceremony. Quite a day! My wife and I recently celebrated our 55th wedding anniversary when we made a trip to Pasadena for my 55th class reunion

—Phil Harriman, BS '59

A MUSICAL JOURNEY

While Caltech certainly enhanced my scientific curiosity, it was my interests in music and musical theater that found their origins at Caltech. Never having done any musical activities in high school, I was plunged into the annual Caltech musical my sophomore year (*Guys and Dolls*), getting one of the leads, Nathan Detroit—a surprise given my utter lack of acting experience. But with the help of our exceptional director, Shirley Marneus, and the wonderful support of all the other cast and crew, I had an absolutely and indescribably marvelous time. I then went on to be in the musicals for my following two years at Caltech, as well as joining the Glee Club.

I can honestly say that those experiences in the musicals had as much of an impact on me as my classes. I learned how to focus on the moment, learn from those around me, communicate my thoughts, and assimilate information coming in from multiple places at the same time, as well as how to give of myself emotionally to others. Learning how to effectively communicate my thoughts and feelings in a larger setting has been indispensable to me in my current lectures to students as a professor of cell biology. When I think of the things that helped me to develop at Caltech, I think of my peers, my classes, my professors . . . and the musicals.

—Stan Cohn, BS '79

A COLLABORATIVE START-UP

In 2014, fellow alumna Vanessa Burns (BS '11) and I cofounded LumosTech, a start-up based on technology that hacks the body's master circadian regulator to treat jet lag and other circadian-rhythm disorders.

My experience as a TA at Caltech was part of the inspiration for founding LumosTech. I noticed that the hormonally late-shifted circadian rhythms of my students—people in their teens and early twenties—combined with the night-owl undergraduate culture at Caltech, made early class times suboptimal for learning. As a result, I held my recitation section in the evening and found that my students were much more animated and engaged than at the morning lecture. While college culture is relatively forgiving to late chronotypes, or night owls, the modern workplace is rarely so accommodating, and many people find it difficult to go to bed early enough to get a full seven to eight hours of sleep before they need to wake up for their morning commute to work.

Using millisecond pulses of light, the smart sleep mask we are developing can shift your circadian rhythm while you sleep, using the same neural pathways as natural light in a way that is optimized to your sleep schedule through a companion smartphone app.

Collaborating with another Techer has been awesome, and I credit much of our success so far to the close and productive working relationship we have. Our experiences at Caltech significantly shaped our ability to develop and manage an early-stage tech start-up. We built our own prototypes, analyzed the scientific literature, and developed a business plan that we could pitch to investors. Without the skills and perseverance we learned as Caltech students, we would not have been able to overcome the many obstacles facing a start-up.

—Kristin Rule Gleitsman, PhD '10