In 2016, the Caltech Y celebrates its centennial anniversary. Originally founded by and for students in 1916, the Caltech Y has remained steadfast in its mission to enrich student life and challenge students to grow into responsible citizens of the world. I believe that one reason for the Y’s longevity is its ability to remain nimble in the midst of the changing needs and potential of the Caltech student body and its broader community. I focus here on the learning that happens on each and every trip and during Y programs, which have evolved and continue to change to serve the students and their changing society.

As we think and rework our programs, we are continuously trying to offer students different perspectives. We want them to have fun, but we also ask, “Can we add something deeper to the fun?” Increasingly, at the Y we see that students want to experience things in an unfamiliar context, exploring the world outside of the confines of the lab and campus. That has led the Y to incorporate service projects into our programming, such as Alternative Spring Break projects in Mexico and Costa Rica. In the past decade, we have expanded our learning opportunities to include winter trips to explore science policy in Washington, D.C., and cultural learning and interchange in India. In addition, students can seek grants to study and travel, often working with a nonprofit organization to broaden or independently exploring passions. In this Annual Report, we see what transpires as students and alumni explore the world, either locally or globally. Two perfect examples are the reflections by our most recent Studentski recipients, Margaux and Alice. Both had transformative experiences, one in a local context and one in an international context.

We are better able to impact society when we think about issues affecting a community, and when we hear from its members. Each year, students learn more about how to work in concert with communities. We see similar thoughtfulness when students plan outdoors trips. They think and talk about their impact, say, of hiking in Yosemite. They don’t just cut through the brush, because that would change the ecosystem.

All our programs build on our student-founders’ strong interest in community, which has been handed down by students, staff, and supporters for nearly a century. In this issue, we hear from John Andelin, who entered the Y scene approximately mid-century as an undergraduate. For almost a decade now, as a science-policy expert—and as a Y supporter with his wife, Ginger—he has shared his knowledge with students during Y science-policy trips.

Programming finds new and improved direction thanks to the dreams of Y constituents. In this issue we see how graduate student Jeremy Sandler takes Y outdoor adventures a step further by incorporating his philosophical and biological interests into a hike. We also see how Fred Shair—longtime Y visionary and current professor—has been inspired by Y awards to dream of an expanded Studenski Award program. At the Y, dreams inspire discussion, and discussion inspires exploration.

Service and learning programs have increased the Y’s need for an expanded support base—one that brings knowledge and skills together with financial resources. To this end, we encourage your participation in the Y’s Centennial Campaign.

We thank all Y participants and partners, including SURF, for the India interchange; the Caltech Employees Federal Credit Union, for the ACT Award; the Studenski family, for the awards described in this Report; and so many others. As support increases, more students can experience these and future opportunities, both domestically and internationally. The Y has remained a strong force for students and community, thanks to your generosity. Your contributions make the Caltech Y a family and give the students a place to test their ideas beyond the traditional lab.

We hope the conversations in the following report provide insight to our readers, and that they inspire you to tell us your stories about how the Y affects you. We invite you to keep in touch, and we’ll endeavor to keep you in the loop as we prepare for the Y’s second century together. Please consider joining us at a Y event—or perhaps at an upcoming dinner as a Friend of the Y—and thanks for joining us here.

Best wishes,
Athena Castro
Executive Director of the Caltech Y

As one of the smallest yet most impactful colleges in the U.S., Caltech is often referred to as a hidden jewel in Pasadena. Within Caltech, one of the hidden gems that makes the Institute spectacular is the Caltech Y. While the Y’s daily operation is run by a small staff of five, the dedicated staff works tirelessly with the Student Executive Committee to plan more than seventy unique events each year and a number of year-round activities to enrich student lives and to challenge students to be responsible citizens of the world.

With the Y about to turn 100, I have been reflecting quite a bit about my experiences here. During my freshman year, the Y was the first campus organization I participated in, through the Union Station program where we prepared and served dinner to the homeless. Later that year, I founded the Caltech Science Olympiad club with advice and support from the Y staff. Even though I was only a freshman, the Caltech Y had started preparing me to be a leader. Throughout my career both as an undergraduate and graduate student, the Y has allowed me to stay engaged with the community through Make a Difference Day and various Explore LA trips and hikes.

As a graduate student, I continued my involvement with the Y and started leading events and the Union Station program. Three years ago, I joined the Caltech Y Student Executive Committee (ExComm) and started leading my own Explore LA trips; “The Book of Mormon” performance, being hilarious while raising cultural awareness, is my all-time favorite.

I also led the Washington D.C. Science Policy trip, which further expanded my horizon from knowing not only how science works in the lab but also how science works in our society and the impact that scientists can have through our government and policies. (For more on that impact, see John Andelin’s D.C. story later in this Annual Report.)

Over the years, the Y has transformed me to become a leader with cultural and social awareness. The most rewarding part of joining the Y, however, is actually helping others to grow into leaders themselves.

The Caltech Science Olympiad club that the Y helped me start a decade ago has grown from twenty Caltech students to over 150 Caltech students today. The current student leaders, with the support of the Y staff, have won the bid this year to have Caltech host the Southern California State Science Olympiad Tournament for the first time, bringing 1,000 of the brightest high-school and middle-school science students to Caltech while providing additional volunteering opportunities for Caltech students.

The Y is truly an amazing organization and has made a huge difference in my life and the lives of many others. I want to take this opportunity to thank the Caltech Y staff, Friends of the Y, and my fellow student leaders for making this such a positive experience. As I finish my final year at Caltech, I know that the Y is going to be one of the most important things at Caltech that I’ll miss. I look forward to all the exciting things that the Y will do in its next century of excellence.

Peter Hung
Caltech Y Student Executive Committee President 2015-2016
In assessing the performance of the Y, it's useful to note that many Y supporters have been involved with the Y for a decade or more. This long tenure says a lot about the Y and its perceived value: it's clearly an organization worth supporting.

It seems logical to ask the question “What makes the Y an organization worth supporting—and supporting over a significant number of years?”

First, the Y has an organizational structure that is focused on the students. The students select, plan, and implement more than seventy activities each year. An Executive Committee of eighteen students does this selection, being mindful of budget constraints and what the larger student population wants to do. In this process the students come to “own” the resulting programs and are thus further motivated to make them successful.

Along the way the students develop skills not taught in the academic classrooms and laboratories. They learn the critical skills of how to work as a team, reach consensus among a large set of possible activities, stay within budget constraints, and coordinate and implement the selected activities.

Those participating in one or more of the seventy-plus activities each year constitute more than forty percent of the student population. The participants can access a wide selection of personal growth opportunities. These opportunities range from developing leadership skills to experiencing outdoor adventure, to civic engagement, to providing service to the local community, to developing perspective on many issues presented by invited speakers.

For a significant number of students, the Y activities also provide an important break from the rigors of the academic programs. This serves to relieve stress and gives the students needed perspective.

With the Y's Centennial approaching in 2016, the Y reached out to the following students needed perspective. This serves to relieve stress and gives the students needed perspective.

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The Caltech Y
2014-2015

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*Indicates student member

Shaping the Student Experience

Caltech is known worldwide for our brilliant students with a reputation for clever pranks and great accomplishments in science and technology. Outside our 124 acre campus and in the popular media, this is often the public image of a “Caltech student.” But many of us know a very different narrative about our students, students that are learning about themselves, about each other, and about the world around them. Students who are curious to explore the outdoors and places beyond our borders, students who are thinking about their role in society, government and how they can effect social change; students who become leaders among their peers, social activists and community volunteers.

Caltech and the Caltech Y play an essential role in creating the environment and opportunities that enable the personal growth and civic engagement of our students. This mission has been the hallmark of the Caltech Y for the last 99 years. The Y has demonstrated the value of empowering students to initiate, create and lead an array of programs that hone their leadership skills, raise their awareness of local and global issues, and give them an opportunity to pause for self-reflection while developing a broader world view.

As someone who benefitted from Y programs as a student, I can attest to the difference that the Caltech Y has made in shaping the student experience and shifting the narrative about what Caltech students are like. My sincere thanks to the Y for working collaboratively with departments across campus and with community organizations so that our students have the opportunity to learn about themselves and their place in the world.

Professor Joseph E. Shephard
Vice President for Student Affairs;
C.L. “Kelly” Johnson Professor of Aeronautics and Mechanical Engineering
Based on the above experience and raising three children who attended Pasadena public schools, Maria says “it is so important to support kids and give them what they need so they can go out and be successful.” It is this philosophy that guides her work in the schools and with community partners.

“The partnership with PasadenaLEARNs started over three years ago by happenstance,” Maria recalls. In 2012, Caltech student and Y ExComm president Peter Hung was interested in getting involved after finding out that Pasadena was hosting a Science Olympiad competition. “Peter bridged the gap and started bringing Caltech students to coach at our schools and do hands-on science demonstrations.”

Current Caltech student leaders and volunteers, led by Vansh, Melissa, and Emil, now go to three Pasadena public schools—Jackson, Madison, and McKinley Elementary—to tutor and lead science demonstrations for kids of all ages. Maria believes the partnership gives Caltech students a sense of purpose and a connection to the community. “Working with children provides these bright college students with a sense of giving back to the community—to education.” The fact that Caltech students take the time to share what they’ve learned is “an amazing gift.”

Guernsey Award Commends Students’ Work with PasadenaLEARNs

Caltech students are bringing fun science directly to elementary schools, and three of them just received the Caltech Y’s Lucy Guernsey Service Award for their work. Melissa Chang, Emil Khabiboulline, and Vansh Kumar volunteer with the PasadenaLEARNs program at Madison and Jackson Elementary Schools. The collaboration has blossomed to include individual tutoring, Science Olympiad coaching, and monthly interactive demonstrations for more than 200 Kindergarten to fifth-grade students.

The children were recently introduced to a Van de Graaff generator, watching “their hair stand straight out from their heads,” as reported in the May 2015 Y Newsletter. Next, they “made a circuit, with one person touching the Van de Graaff and the others holding hands in a line. Their bodies were conducting the electricity, and when the last child in line touched a separate student, the circuit was completed. They all jumped when the flowing electricity delivered a shock!” Volunteers have introduced children to electricity, combustion, and other messy, fun adventures.

The Guernsey Award is given in recognition of Lucy Guernsey, a former Y executive director dedicated to students and Y volunteerism. It rewards exceptional service to the Y and the community, involvement with on- and off-campus service projects, and leadership in community and volunteer service efforts. By earning this award, Melissa, Emil, and Vansh are commended for their spirit of service.
In an impromptu D.C. discussion last summer, John and his wife, Ginger Geoffrey, talked about the 1970 turning point in John’s career. His group’s Skylab project was going well, but Skylab itself was being rushed to the launch pad before it was ready. He was surprised that NASA wasn’t delaying the launch.

John explains the context of his subsequent career change: “Those were tumultuous times, with the Kennedy and King assassinations, student unrest, and the Vietnam War. When I looked at the most straightforward technological organization—NASA—and saw that even they were screwing up, I decided to go to look at what was going on in Washington.” (Fortunately, a Caltech colleague solved a problem with the H-alpha telescope before launch, allowing it to guide the other instruments to interesting regions of the sun.)

“His ‘look’ into D.C. policymaking meant that John was no longer an expert ‘in a narrow technical field’ but a ‘generalist’ or ‘superficialist’ in a broad-based political arena. He worked as a volunteer staffer, then a paid staffer, for Congressman Mike Oakes, as one of only two PhD scientists on the House of Representatives staff. This was followed by his job as subcommittee staff director for the House Committee on Science and Technology. During this time, John and his colleagues collaborated on what became some of the earliest, if not the first, laws in support of solar and geothermal energy, electric and hybrid cars, and energy conservation. “Our only significant mistake is that we didn’t foresee fracking. If I had been trained as an environmental geophysicist, maybe we’d have taken that into account. Unfortunately, Oklahoma is now up to its ears in earthquakes.”

John is dismayed that the solar power laws were “ignored or mangled after being passed. They were authorized,” he explains, “but if Appropriations doesn’t come up with the money, the authorization doesn’t help.” He adds, “Still, solar power is catching on, slowly.”

John’s job to provide Members of Congress with guidance on addressing issues with major technological components and political consequences. John’s division produced dozens of book-length reports, shorter reports and summaries and even brief talking points to serve busy politicians. “Legislators consider more than 5,000 bills every Congress,” he says. “Given so little time to decide on each bill, they depend on staff, the press, and lobbyists.” John wrote about the challenge of being on such a staff in a 1978 Caltech E&S article. “The time demands put upon congressional staff are so great,” he noted, “that we are constantly wishing we had time to know something better.”

John speaks with measured pride about OTA’s role in shaping public policy. “Though many of our reports are more than 25 years old, people continue to build on and refer back to them, including those on climate change, management of federally funded research, physical and electronic infrastructure, and software copyright.”

When John meets with Caltech students during the Caltech Y’s annual D.C. policy trip—before they learn about the OTA’s influence—they sometimes ask, “Why did you do it?”

John has given this question some thought. “There’s a common belief that people switch from science to policy because they don’t like the science they’re doing—or it’s not going well.” But for John, “this was just another interest.” Apparently it was a long-term one.

John’s interest in policy grew while he was an undergrad at Caltech. One might find this surprising, considering that he and his classmates balked at having to take humanities classes. “Oh, come on,” he and his peers would protest. “I just want my physics and math.” But those history and public affairs classes got John thinking about societal issues and obviously came in very handy later.

At the OTA, John added to that. John points out: “The public figures invited by the Y to speak and meet with students challenged us to compare and understand diverse points of view. Two Y [Leaders of America] guests that were particularly memorable were Robert Oppenheimer and Abraham Maslow. Some of the facts we learned in class suffered over time, but the Y’s attitudinal lessons about ethics, acceptance and compassion became only more relevant.”

Is there reason to be optimistic about our future? Yes, “if people take an interest in society and act on it.”

John has seen the Y continue to build and refine its philosophy for six decades. He and Ginger support its “inclusive” public policy by supporting the Caltech Y financially and in person, spending time with Caltech students, for example. (Likewise, they gave time to discuss the Y with me last summer, as we sought refuge from a D.C. heat wave in a restaurant known for its California rolls.) Also dedicated to their local community, the couple works to improve education, social justice, green living, and public discussion of societal issues. Ginger, a speech therapist by training, supports refugees from around the world as she and John help them integrate into society. When newspapers have reported on the couple’s “volunteer” work in the past, John prefers to call this “real people” work.

Discussing civic engagement, John laments that the news we consume in the U.S. “is becoming more and more polarized.” “Everyone we know listens to NPR,” Ginger points out. “I haven’t heard of anyone listening to Rush Limbaugh in years.”

“Polarization is a societal issue,” says John. “Communities need better media outlets, such as the BBC, ironically, to help us see our country as a whole” and solve its problems. “Societal issues are always complex,” he adds, and therefore require careful coverage and public discourse. Unfortunately, complex issues are often poorly served by what John calls the “dishonesty of oversimplification.” John presents evidence of this in the form of conflicting headlines describing a single scientific study. One headline claims that the chemical dioxin is dangerous, and another claims that it’s not. The confusion can come when headline writers don’t read the fine print and when people don’t understand the complexities. Is there reason to be optimistic about our future? Yes, “if people take an interest in society and act on it,” says John. “And that, by the way, is a plug for the Y.”

Where will a person’s interest in society lead, whether inspired by the Caltech Y or other experiences? “My sense of life is that we normally have goals and plans,” says John. “Yet we recognize that things always happen along the way. We may simply adjust to this, or, we may find an opportunity to move over here.” John did the latter, and that has made a difference.
The Studenski Memorial Award is a grant of up to $6000 established in memory of Paul Studenski, a Caltech student who was killed in an automobile accident while traveling across the United States in 1974. It is awarded to a Caltech undergraduate who has reached a crossroads in life and would benefit from a period away from the academic community to obtain a better understanding of self and to explore possible directions for the future. Two recent awards, administered by the Caltech Y, helped Alice Michel engage in wildlife conservation, far afield, and helped Margaux Lopez practice science education at San Francisco’s Exploratorium. Read on about their accounts of what they did and learned.
I assumed this dream was unrealistic. This summer totally changed that...

mammals turned into a love of the whole South African country—the people, animals, nature, all of it. This is a dramatic comment to make, but I honestly think it changed me. Many of the people I met thought differently down there; life wasn’t so much a race, a path to make, but I honestly think it changed me. This past summer, the Studenski Award allowed me to volunteer as a wildlife conservation research assistant in South Africa. At Caltech I study geobiology with an emphasis on microbiology, but I have always loved animals, nature, ecology, and the idea of trying to actually do something, first hand, about the global loss of biodiversity. Until this summer, I assumed this dream was unrealistic. This summer totally changed that, and more.

I volunteered with Operation Wallacea, a UK-based organization that matches undergraduates interested in wildlife conservation with organizations around the world that are seeking volunteers. I chose to work at Thanda Private Game Reserve in South Africa on a project assessing the impact of elephants and other large herbivores on total biodiversity in a relatively small private game reserve. What began as the choice that fit my schedule best and involved large elephant populations. At Thanda, that means all the females are on contraception, and they need volunteers every summer! To figure out how the ecosystem is functioning and if they can afford to let the elephants reproduce. In managing a reserve, it is important to gather data on biodiversity in general.

An average day on the reserve began at Sam, with breakfast, after which we piled into the back of the white Toyota pick-up before the sun had begun to rise. Every day we collected bird diversity data using bird point counts at randomized locations throughout the reserve. Once the sun was up, we set out to collect the bulk of the data during the habitat assessment, in which we measured vegetation—trees, bushes, and grasses, all of which, it seemed, have thorns in Africa—and we looked for the effects of elephants, rhinos, porcupines, fire, and termites, among others. One effect of the critically endangered black rhino, for example, is that branches are bitten at a 90-degree angle. We would return to the main camp for lunch, and afternoons consisted of data entry, lectures on management techniques and spoorn recognition, helping other scientists who passed through Thanda, and game transects, in which we would drive along relatively straight paths and count zebra, impala, nyala, kudu, giraffe, and anything else we encountered.

The most memorable day for me started out with a habitat assessment in Thanda Main. The reserve is divided into three sections with different histories. In this section, driving out, we saw two male lions, and on the way back we saw three bull elephants, the Cape buffalo herd, and even a jackal. This was super exciting and not normal! In the afternoon, two of the other twelve research assistants and I volunteered to help a graduate student visiting from the University of Minnesota who was doing her thesis on predator-prey interactions. This consisted of dragging a cut-out wooden lion on a cart from a Toyota and observing the reactions of the “prey”—impala, kudu, wildebeest, and zebra.

Being from Caltech, I was skeptical. But I am now convinced. It was really interesting to see the reactions of the “prey,” with their attention and concern definitely focused on the “lion.” I got to see a kudu back, stamp their feet, and wildebeest snort, while giraffes stared on with a mildly phased look. The graduate student also had an impala cut-out, as a control, which had remarkably minimal effect on the herbivores. After our work was over, we drove back. The sunset that day was one of the best. I found out later, while reading a book, that the graduate student’s PhD (principal investigator!) is one of the best ecologists in the world.

There were other days that were less exciting but also interesting. We discussed controversial management techniques like culling and trophy hunting in lectures, and in the evenings we played cards and tried to dream up solutions to what I now think is one of the most complicated problems on earth. After three weeks on the reserve, we drove to the coast to do a week of coral reef ecology and become certified PADI scuba divers. This week was designed for the volunteers in my group who wanted to go into marine conservation. I had not thought of myself as interested in marine biology, but now I am. Diving pushed my comfort boundaries more than I expected it to, but it was very worth it for seeing parrotfish, a moray eel, and blue spotted ribbon rays. In addition, I had heard about the state of our oceans, but diving in it and hearing first-hand from people who work on ocean conservation drove it home.

Volunteering in wildlife conservation in South Africa was truly the most incredible experience I could have asked for, and I am so, so grateful for the Studenski Award for making my wildest dreams a reality. The experience was not only more fulfilling and exciting than I imagined, it made me realize how important and possible working on a game reserve could be for me. There is a lot of science and hard fact involved, but morality, philosophy, and working with people come into play just as much. I like that balance, and now I know that it is something I want to look for in whatever I do in the future. I also want a job or school that keeps me outside. Looking towards the future, I want to continue to pursue wildlife conservation or, merging it with my geobiology interests, ecology and evolutionary biology, whether in graduate school, as work, or as a volunteer.
As a senior in mechanical engineering, I struggled to bridge the gap between my love for science and my passion for education. I am incredibly grateful to the Caltech Y and the Studenti family for giving me the opportunity to explore a new-to-me aspect of science education: children’s science centers. I received a Studenti Award to support myself while working as a volunteer at the Exploratorium in San Francisco for five weeks. The Exploratorium is an interactive science center targeted to kids but fun and educational for everyone. I wanted the chance to work there because science museums connect science with fun in a unique way, and I thought that it might be a viable career path. I wanted to learn about exhibit development, and interacting with guests, and how to make science fun and accessible to kids—exploring how to most effectively share my passion for science and engineering with these kids.

I worked with thirty-some paid Field Trip Explainers who work three years before moving on to another position there or elsewhere. Thus these positions are meant to encourage self-discovery as well as foster teaching skills. I had three main jobs: great field trips, run demos, and roam the museum floor. Demo stations located around the museum: a cow eyeball dissection, a light bulb demo, a magic card trick table, a botany station, a plankton station, and some others. The remaining Explainers named the museum floor, tidying up messy exhibits and interacting with visitors in a more organic way. I also had an hour of training every morning before the museum opened. Sometimes the resident scientists would help us understand one of the exhibits more deeply, and other times we would do experiments and activities ourselves such as measuring the tidal levels of the San Francisco Bay or learning how to count atoms and explain how small they are to a kid.

I thought that interacting with visitors while roaming would be easy, but it was much harder than I initially expected. I really wanted to go up and talk to everyone, but I also didn’t want to interrupt their museum experience or bore people that weren’t super interested in the science behind the exhibits. It took me a couple weeks to develop an effective strategy, but by the end I was pretty good at recognizing the visitors that would be open to a discussion. I usually targeted the people (both young and old) that were working on a certain exhibit for more than a minute, because that means they are really trying to figure it out and not just playing with it. I also found that the elderly were a lot more receptive to chatting about exhibits than parents (who were trying to watch their kids) and kids (who were distracted quickly by other things). Throughout my weeks at the museum I became much better at approaching people and finding a way to get them interested in the conversation right away. It was especially important when talking to younger kids.

My favorite part about working at the museum was seeing that “Aha!” moment when I really got through to a visitor and made them excited to learn. There was one demonstration table that involved talking about different types of light bulbs (incandescent, fluorescent, and LED) and making our own demo light bulb with some wires, a battery, and a coil of metal wire. When I showed the light bulb demo to one particular girl, she became really interested in why the glowing metal coil only lasted about a second. To help answer her question, I had her make a couple of different coils to test—some long, some short, some with tighter coils, some looser, and we tested them all. I loved seeing her curiosity and excitement about our mini-experiment, and I could tell that the lesson would stick.

My absolute favorite demo at the Exploratorium is the chain reaction machine. In a roped-off section of the museum there are several tables set up with a giant wooden block on each end, and each block is connected to the two such that knocking over the first block creates a chain reaction that triggers the final block, and so on. The first blocks are pushed over, which knocks the weighted cup off the cup holder and pulls the pink string. The rotating wooden hammer knocks over the silver cup, allowing a ball to roll down the track, bounce on the red rubber “trampoline,” and land in the funnel. The ball triggers the final domino. In the picture, the tables were connected such that knocking over the input block from one table would knock over the output block from another table. After each group had finished their table, one giant chain reaction machine could be triggered. It was a lot of fun to watch, but I particularly enjoyed working with a small group of kids as they got 30-45 minutes to work on their table. I liked helping them through engineering challenges and helping their imaginations grow. I used to love the field trips, and it was nice to see the transition from beginning to end as the visitors went from imaginative ideas to a working machine.

For me, the loss rewarding part of the job was only getting to see the visitors once. Most of the interactions are short, less than a minute, and I rarely got to talk to the same family two days in a row. While I loved seeing visitors get excited about the exhibits, I didn’t get to see any lasting changes. Did the “aha!” moment that I witnessed transform into another at the next exhibit? Did the visitor leave with a stronger appreciation for science? I don’t know, because I never saw the visitor again. I prefer teaching in a classroom setting because seeing change and improvement over time is powerful and rewarding. This is why the chain reaction demo was my favorite—I had the chance to work with visitors all the way through completing a challenge, and it was rewarding to see their hard work pay off in a final project.

The other hard part of the job was focusing on all of the simplified science. I wanted to know the details behind the rainbow colors on soap film (due to destructive interference of the light waves), but I couldn’t explain to a 5th grader how destructive interferences works. I was definitely challenged to explain more complicated phenomena in simple terms, but I also wanted to go deeper myself and learn more, which was hard because only one of the other Explainers had a strong scientific background like mine. While I understand the importance of being able to explain scientific phenomena in an easily understandable manner, I would much rather learn and teach the more nuanced scientific principles because I find them incredibly interesting. I do, after all, have a Caltech science background.

In the end, this experience allowed me to complete this nine week internship in the realm of science education. I learned that a classroom setting is more fitting to my style of teaching because it allows for more intimate interactions. I want to teach the same person over a period of time so that I can see growth and development. However, I loved the flexibility of teaching style that the Exploratorium offered. I learned to tailor my scientific explanations to something that the visitor was interested in. For the girl who wanted to know about light bulb filaments, I was able to do a mini experiment with her right there. For a boy that loved dinosaurs, I was able to help him make a chain reaction machine that included a dinosaur chasing a toy car.

I believe that people learn best when they are excited and interested by the subject matter, so being able to cater to people’s interests when teaching is a powerful tool. It was important for me that I was able to begin developing at the Exploratorium.
2014-15 Programs

Social Programs

✔ Orientation Open House
✔ Explore LA
  - Little Tokyo
  - Galaxy Game
  - The Nutcracker Ballet
  - Piano Guys
  - Horseback Riding (Winter & Spring)
  - Matilda
  - Wicked
  - Legend of Korra/Avatar: The Last Airbender Tribute Exhibition
✔ Decompression (Fall, Winter, Spring)
✔ Pre-Frosh Ice Cream Social
✔ Life Skills Talk: Bike Repair

Outdoor Adventures

✔ Y Hike Backpacking Trip to the Sierras
✔ Undergrad Orientation Kayaking Trip
✔ National Park Camping
  - Grand Canyon
  - Yosemite National Park/Centennial Grove
✔ Adventure 101: Hiking in Los Angeles

Community Service

✔ Undergraduate Student Orientation Service Project, Boys & Girls Club
✔ Community Service and Advocacy Fair

Food Drive
✔ LA River Clean Up

✔ Alternative Spring Break Trips: Catalina Island & Malibu Science Camp

Kids Reading to Succeed
✔ Make-A-Difference Day

On-going Community Service Opportunities
  - Union Station Homeless Shelter (monthly)
  - Hathaway Sycamores (weekly)
  - PasadenaLEARNs (weekly, October through May)
  - Rose Tutoring Program (4 days/week, October through May)

Cultural & Educational Programs

✔ Leadership Lab: “The Uncertainty Principle” with Tim Boyd, Marian Fu, and Nathan Czubaj

✔ World Fest (co-sponsored with Caltech International Offices)
  - Entrepreneurship in Guatemala
  - Top Ten Things I Learned in India
  - International Food Fair & Culture Show
  - The French Connection with Anastassia Terrell

✔ India Ki Khoj International Trip (co-sponsored with Student Faculty Programs & Indian Institute of Technology, Gandhinagar)

✔ Science Policy Trip to Washington, DC

✔ Martin Luther King, Jr. Commemoration Week (co-sponsored with Caltech Center for Diversity): Focus on Freedom Summer
  - Documentary Screening: "Mississippi: Is this America?" (1962-1964)
  - We’ll Never Turn Back: Pursuing Happiness from Freedom Summer to Ferguson with Peter J. Harris & David Crettendon
  - Those Who Lived It: Finding the People Who Were Changed By Freedom Summer and Telling Their Stories with Susan Goldman Rubin
  - A Fight for Civil Rights in Mississippi with Dale L. Gronemeier

✔ Social Activism Speaker Series
  - Reproducibility in Science Seminar Series:
    - A Conversation with Prof. David J. Anderson
    - Flying Blind: Reproducibility in High Energy Physics with Prof. Frank Porter
    - A Conversation with Prof. Pietro Perona
  - Science of Brewing Tour/Tasting at Progress Brewing
  - The Ebola Crisis: Ethical Challenges with Dr. Wendy Kohlhase
  - Courage and Resistance Tour: Panel Discussion & Movie Screening with Betty Meddler and the “Activist Burglars” (co-sponsored with the ACLU)
  - A Discussion with the Civil Liberties Protection Officer of America: Alex Joel
  - The Black Panthers and the Fight for Civil Rights: A Conversation with Hank Jones (co-sponsored with Caltech Center for Diversity)
  - Hydrodynamic Instabilities, Painting and the Story of a Mexican Rebel with Prof. Robert Zent
  - Homelessness and Domestic Violence Panel Discussion and Easter Basket Drive (co-sponsored with Caltech Center for Diversity)
  - Science Policy Lunch Series
    - Dr. William Graham
    - Prof. David Goodstein
  - The Implications of U.S. Space Policy Choices with Dr. Scott Pace (co-sponsored with the Keck Institute for Space Studies)
**STUDENT PROFILE**

Jeremy Sandler

**Encourages Students to Tread New Trails**

“For me, research and hiking are similar things,” says Jeremy Sandler. He is attracted to both, as a biology PhD candidate and as chair of the Caltech Y Outdoors Committee. What’s the connection and the attraction? “Whether I’m hiking over a pass or designing an experiment, I can predict the outcome or anticipate the trail, but the experience isn’t always what I expected,” he says.

Not everyone would crave such challenges, but Jeremy does, and he inspires undergraduates to share his enthusiasm. His “drive to explore and see new things” was nurtured by a mountain-climbing father and his entire family of outdoors-oriented Seattleites. Skiing at age two, sailing to islands to camp with fellow Boy Scouts, and hiking on and near the Pacific Crest Trail led naturally enough to Jeremy’s undergraduate biology studies at the University of Washington. There he enjoyed ecology classes and Mount St. Helens field studies.

Living on the slopes of the volcano in the Summer of 2007, he and peers studied how the volcano’s ecosystem changes. On a recent hike, his group approached the peak … perhaps outside Earth’s gravity field, he says. Each hike, he’ll grab a leaf and hold it for a moment, sometimes when he’s in my backpack for a hike, he’ll grab a leaf and hold and study it for a long time.”

Jeremy’s studies led him to ponder the workings of a fertilized Drosophila (fruit fly) egg. "Patently toiling in the lab of Professor Angela Stathopoulos, he focuses on the phase when the egg's embryonic genome is activated. He asks, "How is the genome activated, and how do the embryonic cells communicate?" He especially likes visiting the Caltech Centennial Grove in Yosemite. Caltech Y Director Athena Castro says, "Jeremy has led the Yosemite trip for a few years now, and thanks to him, we’ve actually had good luck finding the grove the last few years…" Jeremy says the Y’s diverse programming allows busy students to explore many interests “without being spread too thin.” For this, he thanks Y staff members including Greg Fletcher. Jeremy refers to Greg as “the glue that holds all the student programs together.” In addition to staff support, the Y provides equipment funded by the Moore Hufstedler Fund, Student Investment Fund, Caltech Alpine Club, Da Vinci Club, GSC, and personal contributions. New adjustable hiking backpacks allow for one-size-fits-all convenience, kind of like the Y itself. "It’s important that students be able to just show up at Y meetings and events, put in time if they want, and come away with something." Jeremy comes away from Y hikes refreshed and ready to write his three research papers in progress, complete his PhD program—"The end’s in sight!"—and search the horizon for his next professional peak… perhaps outside Earth’s gravity field, as he pursues becoming an aeronaut. Still, the day-to-day climb must be grueling, in the lab, as on some hikes. ”There were times on the Y hike when I struggled on the trail. I usually carry the heavier gear to help out. Being with people helped me get over the path sometimes." Climbing peaks, literally and figuratively, "was easier before we had our baby," says Jeremy. Having a fourteen-month-old is not only a new challenge, it gives Jeremy a new perspective from which to view life. But even this new adventure has connections to old ones.

Jeremy has long understood "how important it is to share the outdoors with other people," and he has "always done that at the Y." But now, "with my son," he explains, "it's more of a personal mission to me than it was before. One of my passions has been introducing him to everything available. And sometimes when he's in my backpack for a hike, he'll grab a leaf and hold and study it for a long time." Jeremy has long understood "how important it is to share the outdoors with other people," and he has "always done that at the Y." But now, "with my son," he explains, "it’s more of a personal mission to me than it was before. One of my passions has been introducing him to everything available. And sometimes when he’s in my backpack for a hike, he’ll grab a leaf and hold and study it for a long time."
FACULTY PROFILE
Fred Shares the Components of a Dream

In the late seventies, Caltech students gained perspective in laboratories and in meeting halls, thanks in good part to Professor Fred Shair. That’s when Fred founded SURF—the Institute’s pioneering Summer Undergraduate Research Fellowship program—which brought undergraduates into labs in growing numbers.

At that time, Fred also helped Walt Meader, the Caltech Y director from 1974 to 1982, to launch the student-faculty conferences. These conferences have given students a forum to voice their concerns for nearly forty years, and they continue today under the leadership of the Associated Students of Caltech. Fred continued his commitment to Caltech with long-time service on numerous faculty committees and on the Caltech Y’s board of directors.

Why has Fred found time for the Y throughout his tenure as a chemical engineering professor (since 1965) and as an active member of the campus community? For decades, as Fred has tracked faculty-student-society interactions, he has seen the Y as a place where students figure out how to impact society with the support of Y staff, the Institute, and involved supporters. He sees how the Caltech Y—as a focused yet interdisciplinary, creative place—is perfectly positioned to respond to changing times.

He wants to give every rising Caltech senior the opportunity to propose and carry out a “flexible, individualized summer program” that could include travel, service, leadership, or all three. Toward this end, Fred sees a need for more such interaction today, all across campus.

“Were Caltech and the Caltech Y to develop such a program,” he says, “it would certainly expand our undergraduate students’ perspective, sensitivity, and opportunities for leadership.”

Fred adds that “it would strengthen the Caltech community throughout the world by providing new links between alumni, faculty, and students. Also, other colleges would try to follow Caltech.”

“I have always thought of Fred as a visionary,” says Y Director Athena Castro, “and we greatly appreciate such input as we usher in the Caltech Y’s next century.”

If you would like to support Fred’s dream of funding programs that help students make a difference and expand their worldviews, please see “Giving to the Caltech Y” on page 25.
2014-15 Individual Donors

We are grateful to the hundreds of people who support our mission through the annual campaign and additional contributions. Here, we recognize those who have donated so generously this past year from October 1, 2014, through September 30, 2015. Thank you!

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Philp and Nancy Naecker

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Gifts and Pledges received for the Centennial Endowment Campaign as of September 30, 2015

The Caltech Y would like to recognize the following donors for their contributions or pledges to our centennial endowment campaign. Through the campaign, the Caltech Y seeks to increase its endowment to ensure a robust financial base and to enable the Y to broaden the range and availability of programs offered to students. The Caltech Y is committed to raising $5 million dollars through the Centennial Campaign.

As of September 2015, we are 50% of our goal. If you wish to contribute to the endowment or help us reach our goal, please contact Agnes Tong, Director of Marketing & Development, or Athena Castro, Executive Director.

John Andelin and Virginia Geoffrey
Carolyn Ash
Richard Beatty
Larry Bergman
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Peter Bloomfield
Beschorman Trust Fund
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*Contributors with an asterisk donate to the Caltech Y via the Caltech United Way campaign during which time their gifts are matched dollar for dollar by the California Institute of Technology.

Caltech Y — making a world of difference

Leigh Engen (Twenty Seven Foundation)
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22
The Caltech Y would like to thank the following campus groups, foundations, companies, and community groups for their contributions to, and sponsorships of, Y programs and events. Your support makes a world of difference.

Corporate and Foundation Support
Caltech Employees Federal Credit Union
Pasadena Tournament of Roses Foundation
Rose Hills Foundation

Caltech Departments and Campus Groups
Alumni Fund and Parents Program Office
Associated Students of the California Institute of Technology (ASCIT)
Athletics
Athenaeum
Alumni Association
Caltech Center for Diversity (CCD)
Caltech Employees Federal Credit Union
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Graduate Student Council (GSC)
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International Scholarly Services
International Student Programs
Jet Propulsion Laboratory (JPL)
Keck Institute for Space Studies (KISS)
Master of Student Houses
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Parking Office
President’s Office
Procurement Services
Science and Engineering Policy at Caltech (SEPAC)
Student Faculty Programs Office
Undergraduate Dean’s Office

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Mike Gabelman
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Community Support
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Arthur Murray Dance Studio
Athenaeum
Blick Art Supplies
Bob Smith Toyota
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Einstein’s Bagels
El Portal Restaurant
Fortune Associates and Associates Physical Therapy
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Lucky Guy Catering
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Pasadena Highlands
PCL Construction Services, Inc.
PPC Mechanical Contractors
Rational USA
Sealey Brothers
Swinerton Builders
Sysco Los Angeles
The Spot Gourmet
Utility Refrigerator

Giving to the Caltech Y

When you make a gift to the Caltech Y, you can choose how the funds will be used as you consider many options for making your donation. Unrestricted Gifts allow the Caltech Y to allocate funds wherever the need is greatest. Your gift may be used across the entire spectrum of Caltech Y annual programs or to build the Caltech Y endowment to insure a healthy future.

Directed Gifts allow you to choose the Caltech Y area of interest that most suits your intention. All donations are tax deductible.

Here are options to consider when making your Unrestricted or Directed Gift:

Charitable Gifts from IRAs: You can rollover your IRA to the Caltech Y and exclude the entire amount of that gift from your taxable income (certain limits apply). You can also create a charitable remainder trust as the beneficiary of your IRA, so that your heirs receive income from the trust, and the Caltech Y receives any principal remaining.

Cash Gifts: made directly to the Caltech Y, are easy. A minimum gift of $200 per person or $400 per couple qualifies you as a Friend of the Caltech Y for that year.

Gifts of Real Estate: such as a second property, vacant land, or income generating property, can provide a much needed boost to the Caltech Y endowment and provide you with an enormous tax savings. By making a gift of property, donors avoid the capital-gains tax and simultaneously receive a charitable deduction for the full fair-market value of the asset.

United Way Pledges: You can contribute indirectly through the United Way throughout the entire year. If you are a Caltech employee, please designate the Caltech Y to receive a 100% United Way Matching gift. Other companies offer United Way Matching as well. Please inquire at your workplace.

Gifts of appreciated securities, stocks, and bonds can provide a considerable tax advantage if transferred to the Caltech Y before they are sold.

Planned Gifts: include bequests, life-income plans and other blended gift options. Your estate gift is an effective and tax-efficient way to make an enduring legacy gift to the Caltech Y.

The Caltech Y can help you with the many giving options.

For more information, please call our office at (626) 395-6163.
Revenue and Support
- Contributions and Grants * $ 433,078
- Trust and Endowment Income** 191,747
- Program Service Revenue 125,187
- Special Events, net 28,734
Total Revenue and Support $ 778,746

* includes donations restricted for the endowment totaling $123,445
** excludes net realized and unrealized gains and losses

Expenses
- Program Activities $ 415,596
- Management and General 109,951
- Development 101,763
Total Expenses 627,310
Excess Revenue over Expenses $ 151,436
CaltechY  ...making a world of difference

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www.caltechY.org or find us on Facebook and Instagram

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Camila Fernandez, Office Manager and Administrative Assistant

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