

Convocation welcomes new students to campus

CALTECH MEDIA RELATIONS

This article was originally published online at caltech.edu.

On Sunday, September 20, Caltech extended a formal welcome to new undergraduate students, graduate students, parents of new students, and postdoctoral scholars at its 2015 Convocation at Beckman Auditorium. Joseph E. Shepherd, vice president for student affairs and the C.L. Kelly Johnson Professor of Aeronautics and Mechanical Engineering, presided over the ceremony, during which speakers urged the incoming freshman class—now 54 percent male and 46 percent female students—to embrace fully Caltech’s intellectually and culturally rich community by taking advantage of the diverse research opportunities and extracurricular activities that the Institute and the surrounding area provide.

“There are many things you cannot learn except by exploring and experimenting,” President Thomas F. Rosenbaum, professor of physics and the Sonja and William Davidow Presidential Chair, said during his remarks to the several hundred people in attendance. “In this welcome, I should like to offer a few guideposts along the road of your exploration. The first guidepost is the necessity to engage with a wide diversity of peers and teachers, to venture outside of the comfort zone of your house and

your division, and together to test and sharpen your ideas.”

Added Rosenbaum: “You need to move beyond simple coursework and delve deeply into a subject on the boundaries of discovery—an opportunity provided by performing research both in the summer, through SURF [Summer Undergraduate Research Fellowships], and during the year. You need to understand other cultures and perspectives. ... You need to take advantage of theater, music, and art on campus, to explore Pasadena’s treasures ... and to sample the cultural accoutrements of the second largest city in the United States: Los Angeles.”

Following Rosenbaum’s welcome, Shepherd introduced a scientific talk and presentation, “Army of Mice or the Big Lion: Engineering in the 21st Century,” delivered by Ali Hajimiri, the Thomas G. Myers Professor of Electrical Engineering, executive officer for electrical engineering, and director of Information Science and Technology. Hajimiri shared some highlights from his scientific research—which range from terahertz-wave imaging to solar power generation in space to biomedical devices to handheld diagnostic devices. He also imparted some final words of advice to the newest members of the community.

“I’ve been here for 17 years, and it’s an incredible place,” Hajimiri said. “You are in the company of great minds. Be one.”



Upperclassmen volunteered to help freshmen move on campus and guide them through the new student orientation.

Photos Courtesy of Bob Paz

Caltech Robotics Team places in international competition

LORI DAJOSE
Caltech Media Relations

This article was originally published online at caltech.edu.

The Caltech Robotics Team — composed of 30 Caltech undergrads and recent alumni — placed fourth in the 18th Annual International RoboSub Competition, held July 20–26 in San Diego, California. The competition, hosted by the Association for Unmanned Vehicle Systems International (AUUVSI) Foundation and cosponsored by the U.S. Office of Naval Research, challenges teams of student engineers to perform realistic missions with autonomous underwater vehicles (AUVs) in an underwater environment. Thirty-seven teams from across the globe competed in this year’s event.

The challenge was to build a robotic submarine that could autonomously navigate an obstacle course, completing tasks such as



The Caltech Robotics Team’s RoboSub, Crush, placed fourth in the international RoboSub competition.

Photo Courtesy of The Caltech Robotics Team

driving through a gate, bumping into colored buoys, shooting torpedoes through holes, and

dropping markers into designated bins. The only human involvement during the competition was the robot were

initial placement of the vehicle into the water.

The Caltech team was divided into three groups, responsible for the mechanical, electrical, and software systems of the robot, which they named Crush. A fourth group managed the team’s fund-raising and outreach efforts. The mechanical team, led by Edward Fouad, a senior in mechanical engineering, was responsible for building grippers, a propulsion system, and a pressure hull to house the robot’s electronics. The autonomous capabilities of the robot were

scratch by the software team, led by Kushal Agarwal, a junior in computer science. The electrical team, led by Torkom Pailevanian, a senior in electrical engineering, designed an inertial measurement unit consisting of gyroscopes and accelerometers that allow the robot to orient itself in 3-D space.

Started in 1998, the Annual RoboSub Competition is designed to introduce young students into high-tech STEM fields such as maritime robotics. This year’s team from Caltech was led by Justin Koch—who graduated in June with his BS in mechanical engineering—and advised by Joel Burdick, the Richard L. and Dorothy M. Hayman Professor of Mechanical Engineering and Bioengineering.

“Last year, as a first-year team, we placed seventh overall and were awarded Best New Entry,” says Koch. “I’m definitely very excited with how we did as only a second-year team!”

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Caltech Y Column

CALTECH Y

The Caltech Y Column serves to inform students of upcoming events and volunteer opportunities. The list is compiled by Neera Shah from information given by the Caltech Y and its student leaders.

Founded by students in 1916, the Y was organized to provide extracurricular activities planned and implemented by students as an opportunity to learn leadership skills and discover themselves. The mission of today's Y remains the same—to provide opportunities that will prepare students to become engaged, responsible citizens of the world. The Y seeks to broaden students' worldviews, raise social, ethical, and cultural awareness through teamwork, community engagement, activism, and leadership. More information about the Caltech Y and its programs can be found at <https://caltechy.org>. The office is located at 505 S. Wilson Avenue.

Ongoing and past programs hosted by the Y:

Alternative Spring Break: Costa Rica, New York, Yosemite

Make-A-Difference Day: LA County Arboretum and Botanic Garden, Children's Hospital Los Angeles, Lifeline for Pets

Explore LA: Lakers game, Next to Normal musical, Norton Simon Museum trip

Upcoming Events

1. Caltech Y's Centennial Kick-Off Celebration & PHD Movie 2 Screening

Tuesday, October 6th | Dinner and Concert 5:00 to 7:00pm

PHD Movie 2 Screening at Beckman Auditorium | Doors open at 7:00

The Caltech Y invites you to join us for the Caltech Y's Centennial Kick-Off Celebration with a Hollywood-inspired dinner followed by an exclusive red-carpet campus premiere of the *PHD Movie 2* followed by a Q&A with writer Jorge Cham, director Iram Parveen Bilal, and cast members. Receive Caltech Y Centennial T-shirts and other prizes. We hope you will join us as we celebrate the Y's 100th birthday!

Dinner is free and open only to Caltech students and special guests of the Y. The movie is free and open to the campus community. Seating is limited and on a first-come first-served basis. Get Caltech Y Centennial T-shirts and other prizes. For more information, please visit www.caltechy100.org. Check out the movie trailer at: https://www.youtube.com/watch?v=yb2y_a7hL5M

Special thanks the following groups for their support: The Caltech Management Association (CMA), Caltech Dining Services, the Institute for Quantum Information & Matter (IQIM) and Piled Higher and Deeper (PHD Comics).

2. Caltech Y Centennial Raffle

Raffle drawing to be held Monday, October 12, 2015

5 tickets for \$20, 1 ticket for \$5

Proceeds to benefit the student programs and activities of the Caltech Y. Enter now for a chance to win a GoPro Hero 4 or an Apple Watch. Purchase your tickets today! Stop by the Y or the cash registers at Chandler.

Winners need not be present. Items can be shipped at winner's expense.

3. Rise Program

The Rise Program is an afterschool math and science tutoring program for public school students in grades 8-12. The program is in its eighth year and helps students who are struggling in math or science (getting a C or below). Tutoring takes place at Caltech Monday-Thursday, 4pm-6pm. The program is designed to help students gain greater competency in math foundations, improve skills in math and science and prepare students for college-level math and science. Tutors work with 1-2 students and when possible work with the same student(s) throughout the year.

Tutors should be able to commit to at least 2 terms per year and 1-2 days per week. The schedule is based on the tutor's availability. Tutoring sessions are 2 hours. If you have any questions, contact Liz Jackman at ljackman@caltech.edu or by phone at 626-395-6163.

Other Announcements - Beyond the Caltech Y

CCI Solar Science Clubs

Volunteers Needed

CCI Solar has 2 science clubs working with the Pasadena community and we need volunteers! Once club meets every other Wed from 9-11am. We work with educators from Kidspace and teach 2-9th graders at the 5 Acres school fun science lessons. These students have some academic, social and behavioral challenges and really benefit from these engaging science activities. Transportation to 5 Acres campus in Altadena will be provided.

The second club is brand new, in collaboration with STEAM:CODERS. 15 PUSD middle school students will meet at Caltech on Saturdays for 8 weeks per quarter for fun science lessons. We need volunteers to commit to helping for a couple hours each Sat to teach these activities. Special guest lessons by clubs and research groups are also welcome if you can't make the 8 week commitment.

If you are interested in helping with either club or want to know about other volunteer opportunities with CCI Solar contact Michelle DeBoever at mchansen@caltech.edu.

News briefs from around the globe

A brief list of events from the past week, compiled by the editors

Nigerian forces raid two Boko Haram camps

241 women and children in Boko Haram camps were freed [CNN]

China establishes fund for developing countries

\$2 billion in investment fund thought to reach \$12 billion over 15 years [BBC]

Glass-bottomed bridge built in China

1,250-foot long bridge rests 600 feet above canyon floor [TIME]

Thousands march to mark anniversary of disappearance

43 students went missing one year ago in Mexico [BBC]

Europe flooded by refugees

8,000 refugees flee to Europe each day, mainly from Syria and other conflict zones in the Middle East and Africa [BBC]

Switzerland bans sale of VW diesel-engine models

180,000 unsold/unregistered cars could be affected by the ban, which came after VW admitted to cheating on U.S. emissions tests [BBC]

Muslim pilgrims killed, injured at annual hajj

769 people were killed at the hajj in Saudi Arabia [TIME]

Caltech live!

EARNEST C. WATSON
LECTURE SERIES

Wednesday, October 14, 2015 / 8 PM

BACK TO THE BEGINNING: THE ROSETTA COMET RENDEZVOUS MISSION

Comets are the most primitive bodies in the solar system. They retain a physical and chemical record of conditions in the solar nebula, the vast cloud of interstellar dust and gas where our solar system formed more than 4.5 billion years ago. Rosetta is the first spacecraft



to orbit a cometary nucleus and will study it for more than two years as the comet moves closer to the Sun and then back out again. In this lecture, Weissman will recount Rosetta's arrival at the target comet in August 2014 and will discuss the many scientific discoveries accomplished so far.

PAUL WEISSMAN

Former Senior Research Scientist,
Jet Propulsion Laboratory

Free Admission
Caltech's Beckman Auditorium
www.events.caltech.edu



Call campus x 4652 for information

The California Tech joins the Caltech community in welcoming the following to their new positions on campus:

Felicia Hunt - Assistant Vice President for Equity, Accessibility, and Inclusion Initiatives

Joseph Shepherd - Vice President for Student Affairs

Guruswami "Ravi" Ravichandran - Chair of the Division of Engineering and Applied Science

Doug Rees - Dean of Graduate Studies

Chvrches' *Every Open Eye* echoes band's first album

NAILEN MATSCHKE
Contributing Writer

Something I remember very clearly from September 2013, when I came to Caltech, is how it seemed as though I couldn't go anywhere without hearing something of Chvrches' debut album, *The Bones of What You Believe*. The Glaswegian band's sound was easy to soak up, with layers of bright yet punchy synths and poppy, danceable beats laying the foundation for frontwoman Lauren Mayberry's soaring, earnest vocals. What truly made Chvrches an overnight success, though, was the group's ability to produce memorable parts for each member and massive hooks with consistency. It has certainly been fair to accuse Chvrches of recycling the same ideas in just about every song, but at the same time it's difficult to dislike an album that's basically 50 percent single-quality tracks. Almost exactly two years later, we've gotten the group's follow-up, *Every Open Eye*, and it's not quite what I was hoping for.

The root of this lies in what I would have wanted to see when it comes to the progression of the band's style on this album. Instead of taking a step forward in any one direction, the band has gone to the side, or perhaps even backward. One of my favorite things about *TBOWYB* was its dynamic

instrumentals, particularly the synths, which had plenty of power and used it when necessary. Chvrches is by no means lacking in the pop sensibility department, so it seems like mixing in more of the distorted, almost aggressive elements present on tracks like "Gun" and "Lungs" would elevate the band's sound to a new level. What we get on *Every Open Eye*, however, is an even more saccharine and smoothed-out performance that often wouldn't feel out of place in the Top 40. The chorus of "Playing Dead," for instance, struck me as being influenced by circa-2000 mainstream pop, or even progenitors such as ABBA. It's a catchy enough melody to remember, but so ordinary it easily fades into the background, like the Muzak you hear in supermarkets. The mix itself seems flatter as well, replacing the deep oceans of sound that *TBOWYB* lead singles "The Mother We Share" and "Recover" brought to the table with some very monotonous, toothless production.

This regression in the band's individuality isn't helped by my other main gripe with the album — it fails to present any new side of Chvrches. Every aspect of the band's music that didn't trend toward the mainstream just stayed the same, which is especially obvious in the vocals that still have lyrics you could easily swap for Linkin Park's without many noticing. I do

give credit to Mayberry for selling them well, and her performance is technically pristine, but her presence is better at completing the sound than enhancing it. It's also only a part of a general issue the band has with extending habits that already made their first album bland to their second. The formulaic and invariant song structure produces a large amount of filler songs with simple, repetitive hooks and melodies. "Empty Threat" and "Bury It" come to mind as two that had me tired of them midway through my first listen. Even if the somewhat sterile sound of *Every Open Eye* does end up pleasing Chvrches' fans, *TBOWYB* left so much room for the group to push their boundaries regarding sounds, moods, or something else, and they squandered every opportunity on its successor.

Thankfully, Chvrches nailed the important pieces of its sound on its debut, and one can imagine that "more *TBOWYB*" is an idea bound to generate some solid material. "Leave a Trace" has an absurdly catchy hook that gets even better as it moves from its first half to its second, and it's followed by "Keep You On My Side" with its epic, driving chorus that belongs in an '80s action movie score; only a few tracks later is "High Enough to Carry You Over," in which Martin Doherty takes on lead vocals in addition to his usual contribution

of synths and samples, resulting in a funky, infectious danceable tune that reminds me more than a little of The Weeknd's "Can't Feel My Face." When Chvrches members are on their songwriting game, they are an unstoppable pop force capable of churning out masterful earworms and then wisely rationing them to listeners. They do also throw a handful of new ideas into the mix, such as "Clearest Blue," which spends its first two minutes building up to a loud, off-the-wall energetic drop (think My Chemical Romance's "Planetary (GO!)"). This pattern is almost duplicated in "Down Side of Me," which is based around a hauntingly beautiful, thickly harmonized vocal passage for its first half and then switches to a long build-up driven by some dark synth stabs.

Closer "Afterglow" is also a hard one to forget, as it is the most emotional and intimate track the band has released. Contrary to most of her singing, Mayberry comes off as vulnerable here as she is presented dead in the spotlight, atop a sparse layer of swirling synths, with her voice so much the center of attention that one can easily hear the breaths she takes in between

lines. It's a beautiful moment, and an excellent closer for the album.

I found this release by Chvrches to be underwhelming, but at the same time I don't dislike it. Rather, I'm mostly disappointed with how little the band seems to have learned since its first release. Chvrches had a lot of potential and I think the group could have dropped something amazing this time around by just being a bit more adventurous, but it's almost as though the members didn't even try. *Every Open Eye* has some great tracks on it that I'm sure we'll all be hearing more of in the coming weeks, but as far as what it means for Chvrches is concerned, I hope it's not a sign that the band is succumbing to its one-trick-ponyism. It's not a bad album, but I'm not feeling it.



-<http://www.stereogum.com>

Join the Meditation Mob!

Tuesdays, 12:00 - 12:50

Want to learn more about mindfulness meditation? It's a great way to improve your attention and to become more grounded in the present moment.

There's no religious component. We use secular, evidence-based meditation techniques.

We meet in the small room just off the lounge in Winnett. All students are welcome, from total beginners to more experienced meditators.

Mailing list and MP3 archive:
counseling.caltech.edu/students/meditation



Frosh camp viewed through the lens of *The California Tech*



Frosh learn about collaboration and help each other out in this obstacle course during the session for Study Habits.

Photo Courtesy of Nehaly Shah



Team BPQ cheers as their boat wins the final round of the annual design competition. Junior Kit Chinetti and sophomore Carly Robison organized the event.

Photo Courtesy of Neera Shah



Frosh get cozy with their Freshman Camp Counselor, senior Cat Jamshidi, and work to untangle themselves from a "human knot."

Photo Courtesy of Nehaly Shah



One group of frosh tries to take over another during a tandem bicycle obstacle course as station leader junior Kai Chang guides them through a Study Habits task.

Photo Courtesy of Neera Shah



Senior Catherine Pavlov helps her group put together puzzle pieces that were retrieved from the bottom of the hotel swimming pool. Sophomore David Kawashima (left) was in charge of this part of Study Habits.

Photo Courtesy of Nehaly Shah



Incoming freshmen Tyler Port and Noah Huffman have fun at the ballroom dance lesson given by the Ballroom Dance Club.

Photo Courtesy of Neera Shah

Men's water polo places fifth at Citrus Tournament

GOCALTECH.COM
Actual Sports Content Editor

GLENDORA, Calif. (Sept. 12, 2015) – The Caltech men's water polo team picked up three wins to place fifth at the Citrus College Tournament this past Friday and Saturday.

Junior Christopher Bradley and senior James Blackwood carried the Beavers on offense, combining for 29 goals and 12 assists over the four-game tournament.

After dropping the opener to the host Owls, 17-10, the Beavers closed out the event with three straight dominant wins over San Diego Miramar College (11-4), Santa Monica College (11-5) and Grossmont College (12-5) to improve to 4-2 to start the season.

Citrus 17, Caltech 10

The Beavers opened the tournament with a slow start against the hosts, falling behind 5-0 in the first quarter. A timeout allowed Head Coach Jon Bonafede to adjust the defense and Caltech began to pull back into the game. Senior Patric Eck drew an exclusion with 1:30 left in the first quarter and then scored with the man advantage on a post shot off a beautiful pass from Blackwood.

"I have been making that same pass to Pat for a long time now," Blackwood said. "It is like second

nature to know when he is open on the 6-on-5."

Once on the scoreboard, the Beavers gained more momentum through the second quarter, outscoring the Owls 3-1 to narrow the margin to three at 7-4 by the break. Bradley capped the half with a 5-meter penalty conversion just 19 seconds from the whistle.

As the third quarter got underway, Blackwood, Bradley and freshman Eshan Govil each found the back of the net, but Citrus was able to muster four goals to extend the lead and sealed the victory with a seven-goal fourth quarter, led by All-American Jonathan Lotero. Bradley notched a pair of goals and Eck added one for the Beavers in the final period. Freshman Shaurya Gilani made six saves in net over the first half while freshman John Lloyd recorded two in the second half.

Caltech 11, Miramar 4

Although Caltech got off to a slow start in the second game, Govil handed the Beavers the lead with the only strike of the quarter at the 3:44 mark. Freshman Charles Ross kept Miramar off the board with a huge save on a breakaway and the Beavers extended the margin to two by halftime, courtesy of a pair of goals by Blackwood.

Caltech pulled away in the third quarter, capped by four

unanswered goals in the final four minutes, with two each from Blackwood and Bradley. Freshman Billy Bloomquist out with a late goal in the third quarter and another strike in the fourth while Bradley netted two more. Ross finished an impressive performance in net with 12 saves and two steals.

Caltech 11, Santa Monica 5

The Beavers entered Day Two refreshed from the big win over Miramar, jumping out to a 3-0 lead on their first three possessions over the first two minutes vs. Santa Monica, thanks to several quality plays. Bradley connected on a pass to junior Tomas Tussie at the 7:22 mark and, after a pair of successful defensive stands, Blackwood found the back of the net on a counterattack from the hole set 40 seconds later and Tussie converted out of hole set on a nice step-out shot. Santa Monica pulled one back before the end of the quarter, but Bradley went off for a whopping five goals in the second quarter to stake Caltech to an 8-2 lead heading into halftime. With the busy weekend slate, the Beavers rotated players a bit more than usual and senior Matthew Cedenio came up with a big goal from the post on an assist from sophomore Henry Baer just 27 seconds from the final whistle. Lloyd and Gilani combined to make nine saves in goal.



"Ball is life." – James "Jim" Blackwood

-<http://gocaltech.com>

Caltech 12, Grossmont 5

After defeating Grossmont by a lone goal just one week prior, the Beavers knew what they were facing in Grossmont and took control from the outset. Blackwood netted the first goal just 35 seconds into the game and, after Grossmont equalized, stretched out to a 4-1 lead by the end of the first quarter and 8-1 at halftime. The Griffins mustered two more goals in each of the final quarters, but the Beavers were never in danger of letting the lead slip away as Ross, Gilani and

Lloyd combined to stop 17 shots and Baer led the defense with four steals.

"We are getting a lot better at team defense and counterattacking, and that showed in the score difference just a week after beating them on our first day of competition," Bonafede said. "Guys are starting to build chemistry in their playing styles and it is creating a lot of good scoring opportunities. We had a really good shooting day and were working hard to get good looks."

Ball, Wilkening score in OT defeat at Cal Lutheran



This picture is not from the Cal Lutheran game, but that is Teo Wilkening with the ball, so at least we got that part right.

-<http://gocaltech.com>

GOCALTECH.COM
Actual Sports Content Editor

THOUSAND OAKS, Calif. (Sept. 23, 2015) – The Caltech men's soccer team took host Cal Lutheran University to overtime before falling, 3-2, on a hat trick by SCIAC-leading goalscorer Brandon Kearney on Wednesday night.

The Kingsmen improve to 2-5-1 overall and 2-3 in the SCIAC while the Beavers drop to 0-5 (0-5).

Junior J.D. Feist was called upon to make a save just one minute into play and Cal Lutheran kept

the pressure on, netting the go-ahead goal in the seventh minute. The Beavers leveled nine minutes later as junior Alec Sands headed a pass down to senior Adam Ball, who popped a shot past the goalkeeper to make it 1-1. CLU continued to enjoy the majority of possession for the remainder of the half, but neither team managed to put another shot on target before halftime.

Caltech struck again two minutes into the second half to take the 2-1 lead when freshman Jack Banaszak played a ball into the box, where senior Theodore

Wilkening rose up to head it into the back of the net for his second goal of the season. The Kingsmen searched furiously for an equalizer and found it in the 64th minute courtesy of Kearney's second goal, immediately after which Wilkening nearly put Caltech back on top with another shot on target. CLU would continue to apply pressure but the Beavers defense held firm in front of Feist to turn away every opportunity.

The game headed to overtime, where Kearney would complete his hat trick on the only shot of the period to hand CLU the win.

Maiyuran, Vetrivel lead volleyball to set win against Providence Christian

GOCALTECH.COM
Actual Sports Content Editor

PASADENA, Calif. (Sept. 15, 2015) – Senior Harinee Maiyuran made a career-high 20 assists as the Caltech volleyball team took a set against Providence Christian College in the Beavers' home opener on Tuesday night.

Caltech outlasted PCC in a 26-24 first set victory, but the Sea Beggars posted a dominant 25-10 second set to level the match and clinched with 25-16 and 25-14 wins in the third and fourth. The Beavers are now 0-5 on the season.

The Sea Beggars jumped out to an 8-2 lead to open the match and held the margin until 14-8. The Beavers then struck for seven

14 points on kills, with Maiyuran tallying eight of her assists in the set.

Caltech hung close early in the second set but PCC broke a 7-7 tie with a ridiculous 18-3 run to level the match. The third set was far closer but the Sea Beggars still controlled play throughout to take a 2-1 lead in the match. The Beavers stormed out to a 7-3 lead to open the fourth set, but PCC recovered to cruise to the match-clinching victory, with Caltech only mustering a late 5-2 run before succumbing.

Vetrivel led the Beavers with 12 kills while sophomore Mayra Melendez and senior Meghana Pagadala recorded 13 and 12 digs, respectively. Senior Amarise Little added three block assists.



Harinee Maiyuran is trying to remember whether or not she locked her door when she left.

Photo Courtesy of Michael L. Wong

Caltech community members remembered after passing

CALTECH MEDIA RELATIONS



Eric H. Davidson

-http://caltech.edu

The following are excerpts from the full obituaries published online at caltech.edu.

Eric Harris Davidson, Caltech's Norman Chandler Professor of Cell Biology, passed away on Tuesday, September 1, 2015. He was 78 years old.

Davidson, a developmental biologist, was a pioneer researcher and theorist of the gene regulatory networks that perform complex biological processes, such as the transformation of a single-celled egg into a complex organism. His work helped to reveal how the DNA sequences inherited in the genome are used to initiate and drive forward the sequence of steps that result in development.

Written by Kathy Svitil:

Charles A. Barnes, professor of physics, emeritus, at Caltech and an expert in the study of both the weak nuclear force—one of the fundamental forces of nature—and of the nuclear reactions that produce the majority of the elements in our universe, passed away on Friday, August 14, 2015. He was 93.

He came to Caltech as a research fellow in 1953 and became a senior research fellow in 1954, an associate professor in 1958, and a professor in 1962. An experimental physicist who specialized in nuclear physics, Barnes performed pioneering research in two key areas. The first



Claudia Alexander

-http://caltech.edu

was in the study of the so-called nuclear weak force, which governs the radioactive decay of elements and is responsible for the fusion of protons to form deuterium. This fusion releases the energy that is the source of heat from our sun and other stars. Barnes retired in 1992.

Written by Rod Pyle:

Claudia Alexander, a longtime employee of JPL, died July 11 of cancer at the age of 56. She was the U.S. project scientist for the European Space Agency's

Rosetta mission, which continues to explore comet 67/P Churyumov-Gerasimenko, and was the last project manager for the Cassini mission to Saturn. She also worked on the Galileo mission to Jupiter.

In addition to her career on JPL's technical staff, Alexander advocated for STEM activities and for the empowerment of young women preparing for careers in science. She was also a book author, having written a number of children's and popular science books.

including those of Capital Research and Management Company and American Funds Distributors, Inc., and he was a portfolio counselor for the Growth Fund of America and vice chairman of the Growth Fund of America and Fundamental Investors.

Rothenberg was elected to the Caltech Board of Trustees in 2006. He chaired the board's Business and Finance Committee, served as vice chair of the Development Committee, and was a member of the Investment Committee. He has played a key role in the life of the Institute as campaign co-chair and as a member of the Caltech Associates.



James F. Rothenberg

Photo Courtesy of Capital Group



Charles A. Barnes

Photo Courtesy of Bob Paz

Rotation schedule

Date	Wed. 9/23	Thu. 9/24	Fri. 9/25	Sat. 9/26	Sun. 9/27	Mon. 9/28	Tue. 9/29	Wed. 9/30	Thu. 10/1
Lunch				D	F				
Dinner	A	B	C	E		G	H	Free Dinner	Free Dinner
Dessert	1	2	3	4	5	6	7	8	

		Avery	Blacker	Dabney	Fleming	Lloyd	Page	Ricketts	Ruddock
Wed 9/23	Dinner A	5:30pm	5:30pm	5:45pm	6:15pm	5:45pm	6:15pm	5:15pm	6:00pm
Thu 9/24	Dinner B	5:30pm	5:30pm	5:45pm	6:15pm	5:45pm	6:15pm	5:15pm	6:00pm
Fri 9/25	Dinner C	5:30pm	5:30pm	5:45pm	6:15pm	5:45pm	6:15pm	5:15pm	6:00pm
Sat 9/26	Linner D	1:00pm	1:05pm	1:10pm	1:15pm	1:00pm	1:10pm	1:00pm	1:05pm
Sat 9/26	Dinner E	5:30pm	5:30pm	5:45pm	6:15pm	5:45pm	6:15pm	5:15pm	6:00pm
Sun 9/27	Linner F	1:00pm	1:05pm	1:10pm	1:15pm	1:00pm	1:10pm	1:00pm	1:05pm
Mon 9/28	Dinner G	5:30pm	5:30pm	5:45pm	6:15pm	5:45pm	6:15pm	5:15pm	6:00pm
Tue 9/29	Dinner H	5:30pm	5:30pm	5:45pm	6:15pm	5:45pm	6:15pm	5:15pm	6:00pm
Wed 9/30	Free Dinner	6:00pm	6:00pm	6:15pm	6:45pm	6:15pm	6:45pm	5:45pm	6:30pm
Thu 10/1	Free Dinner	6:00pm	6:00pm	6:15pm	6:45pm	6:15pm	6:45pm	5:45pm	6:30pm

Date	Time	House	Event
Every Day	After Dinner	Blacker	Do Try This at Home
Thursday, 9/24	8:00pm-10:00pm	Avery	Boba and Board games
Thursday, 9/24	10:30pm-12:30am	Page	Chill @ Page
Friday, 9/25	7:00pm-9:00pm	Dabney	Thrilling Tea Adventure Hour
Friday, 9/25	10:30pm-12:30am	Ricketts	Open Mic Night
Friday, 9/25	10:30pm-12:30am	Ruddock	Cafe Ruddock
Saturday, 9/26	10:30pm-12:30am	Fleming	Dirty Dodgeball
Saturday, 9/26	11:59pm(Sat)-2:00am	Lloyd	Captrue the Flag and Milkshakes
Tuesday, 9/29	11:00pm-11:59pm	Fleming	Feptathalon

Note: The times listed above indicate the start of the reception at each house. Food will be served 30 minutes after the times listed. For the free dinners on Wednesday and Thursday, there will be no receptions, and dinner will begin at the times listed.

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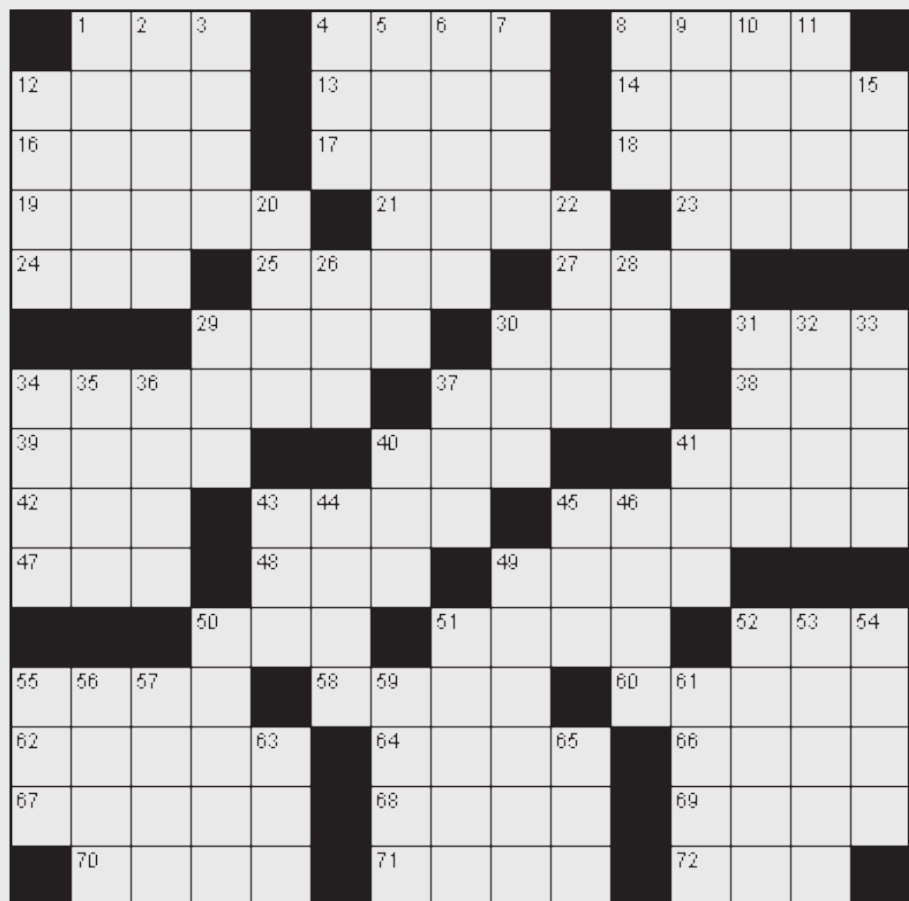
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The Tech is published weekly except during vacation and examination periods by the Associated Students of the California Institute of Technology, Inc. The opinions expressed herein are strictly those of the authors and advertisers.

Letters and submissions are welcome; e-mail submissions to tech@caltech.edu as plain-text attachments, including the author's name, by Friday of the week before publication. The Tech does accept anonymous contributions under special circumstances. The editors reserve the right to edit and abridge all submissions for any reason. All written work remains property of its author.

The advertising deadline is 5 PM Friday; all advertising should be submitted electronically or as camera-ready art, but The Tech can also do simple typesetting and arrangement. All advertising inquiries should be directed to the business manager at tech@caltech.edu. For subscription information, please send mail to "Subscriptions."

Crossword



-http://puzzlechoice.com

Across

- 1. Institute legal proceedings against
- 4. Junk e-mail

8. Hoodlum

- 12. Hex
- 13. Type of cabbage
- 14. Wading bird
- 16. Not in favor of

17. Golf club

- 18. Bird of prey
- 19. Spiritual being
- 21. Refuse to acknowledge

- 23. Physically skilful
- 24. Sheep
- 25. Woodwind instrument
- 27. Beam
- 29. Scheme
- 30. Worthless or oversimplified ideas
- 31. Cutting tool
- 34. Brush
- 37. Ancient German alphabet character
- 38. Pool stick
- 39. Corrode
- 40. Crone
- 41. Naked
- 42. Mountain
- 43. Large predatory feline
- 45. Parka
- 47. Month
- 48. Consumed
- 49. Humble request for help
- 50. Hotshot
- 51. Drink made by steeping, boiling and fermenting
- 52. Cooking utensil
- 55. Space for movement
- 58. To a greater extent
- 60. Topic
- 62. Relating to hearing
- 64. Writing table

- 66. A particular environment
- 67. Superficial abrasion
- 68. Part of a calendar
- 69. Fabric used to dress wounds
- 70. Sleigh
- 71. Smoke and fog
- 72. Of long duration

Down

- 1. Tendon
- 2. Undo
- 3. Way out
- 4. Snow runner
- 5. Minister of religion
- 6. Solitary
- 7. Bill of fare
- 8. Definite article
- 9. Intoxicating
- 10. Exhort
- 11. Outdoor game
- 12. Semiprecious gemstone
- 15. Mesh
- 20. Part of an egg
- 22. Food from the husks of cereal grains
- 26. Larger than a cove but smaller than a gulf
- 28. Primate
- 29. Domestic companion
- 30. Breed of dog
- 31. Evidence of past injury
- 32. Nimbus

- 33. Seven days
- 34. Pack to capacity
- 35. Polynesian rain dance
- 36. Catch sight of
- 37. Operated
- 40. Gardening tool
- 41. Constrictor
- 43. Used in varnishes and sealing wax
- 44. Detail
- 45. Beer
- 46. Triton
- 49. Very fast tempo
- 50. Astound
- 51. Freshwater fish
- 52. Danger
- 53. Ameliorate
- 54. Orderly
- 55. Tatter
- 56. Belonging to us
- 57. Examination by word of mouth
- 59. Betting ratio
- 61. Circle of light around the sun or moon
- 63. Was ahead of the others
- 65. Small cask or barrel



The Student-Faculty Programs office would like to publicly thank the 2015 SFP House Ambassador Committee for successfully building and fostering a welcoming and inclusive student community this summer! Generating creative ideas to organically bring students together combined with hard work, focus, and teamwork, the House Ambassadors enriched the summer experience for all students at Caltech. Thank you SFP House Ambassadors!

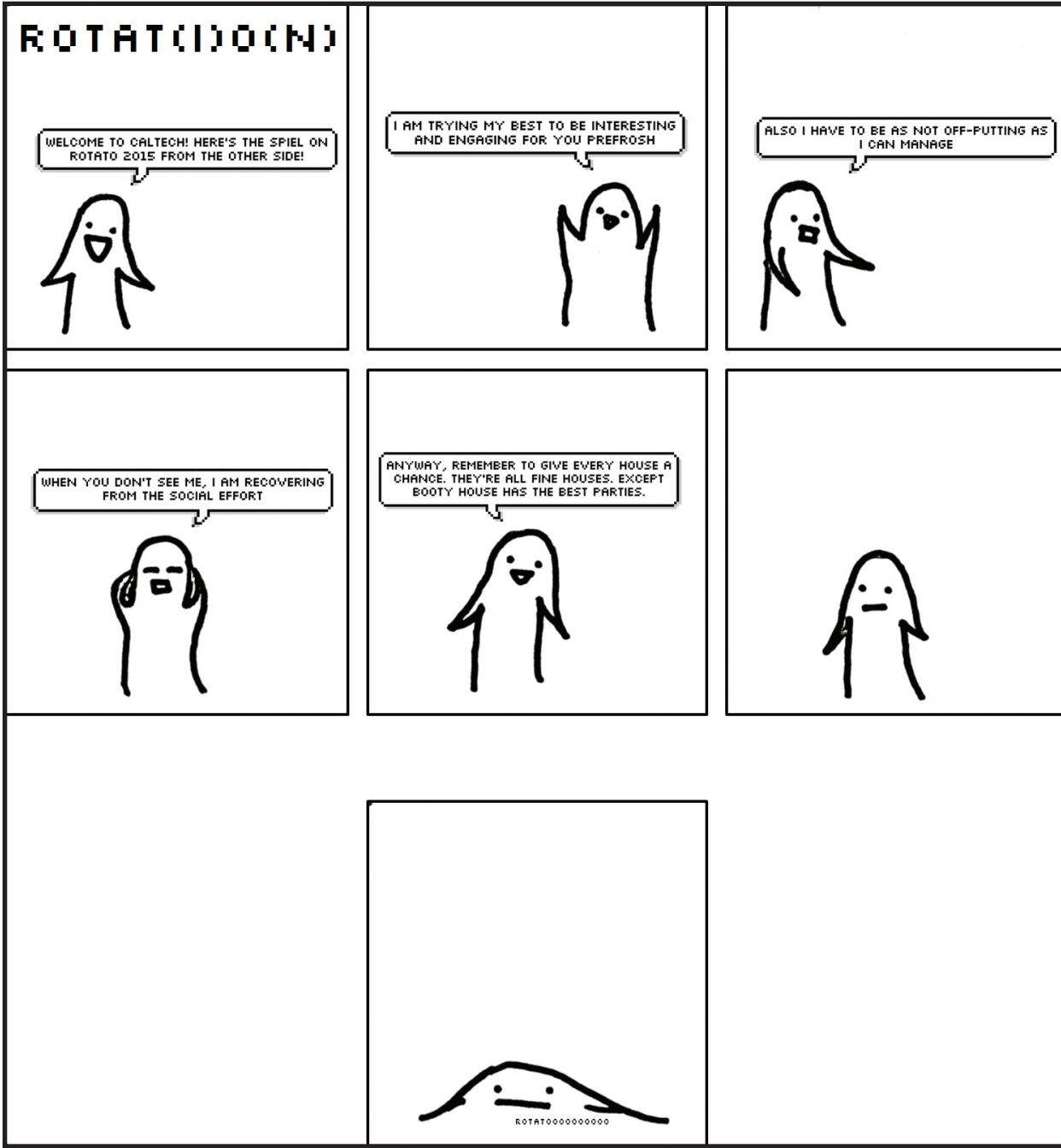
2015 SFP House Ambassador Committee

Last Name	First Name	House
Kang	Andrew	Avery
Lin	Amanda	Avery
Chaffee	Thom	Blacker
Minear	Talia	Blacker
Antonello	RJ	Dabney
Humes	Oriel	Dabney
Joshi	Rushikesh	Fleming
Kim	Lani	Fleming
Lee	Ga Yeong (Grace)	Fleming
Levine	Garrett	Fleming

Last Name	First Name	House
Chen	Kevin	Lloyd
Woo	Kelly	Lloyd
Cai	Sarah	Page
Chou	Christine	Page
Yap	Ker Lee	Page
Adams	Carson	Ricketts
Delgadillo	Serena	Ricketts
Parker	Alexa	Ricketts
Anferov	Alexander	Ruddock
Han	Sirus	Ruddock

Go0000

K. Guo



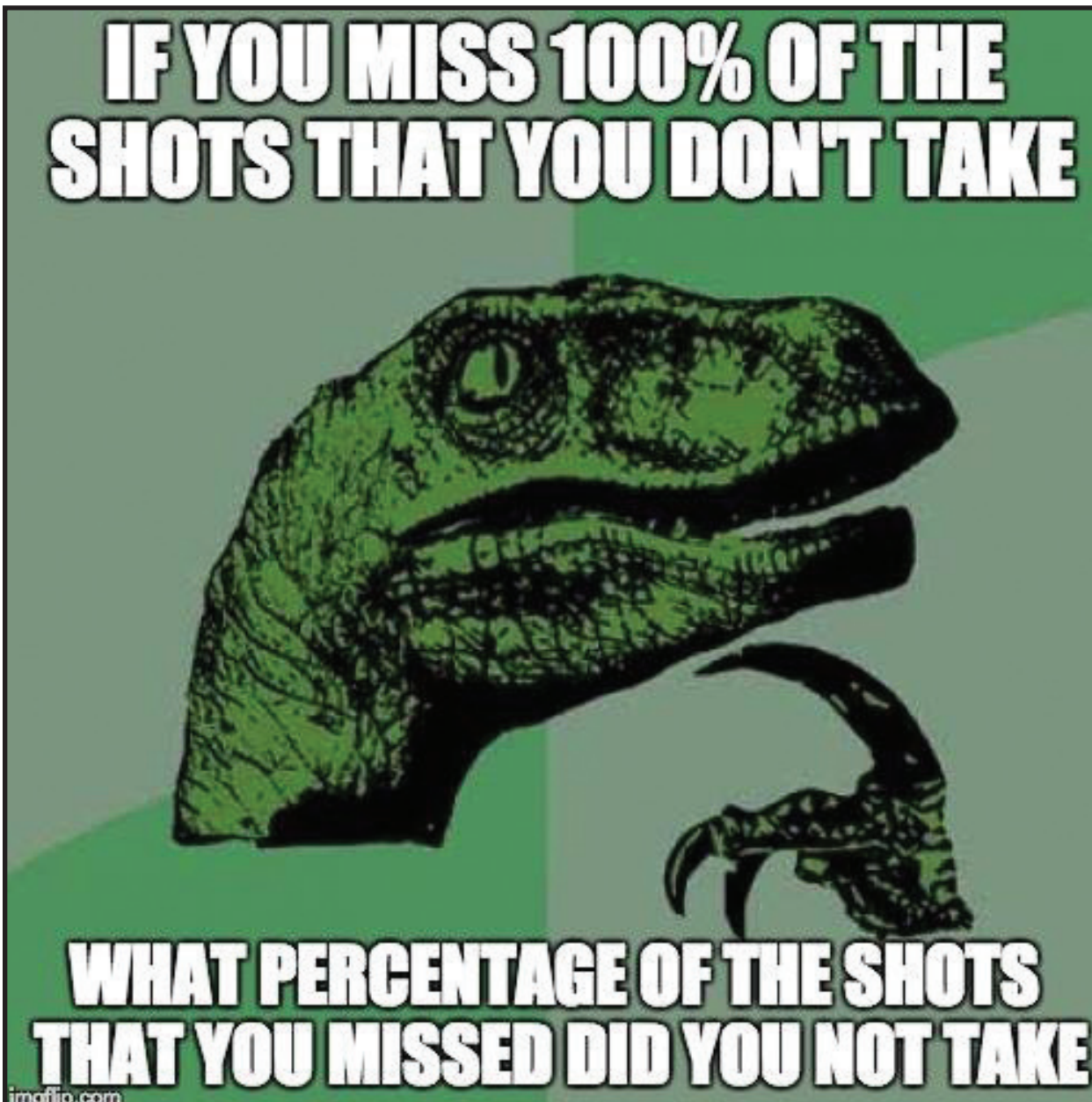
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A Conundrum

Memester



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