



VOLUME CXIX NUMBER 25

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TECH@CALTECH.EDU

APRIL 25, 2016

# Photoblast: Ge 1 field trip to Mammoth



The Ge 1 class went on a three-day camping trip, visiting sites such as the Panum Crater, Owens River Gorge and Red Rock Canyon State Park to learn more about the earth through some of California's finest geological features.

Photos Courtesy of Hye Joon Lee and Preston Zhou

## News briefs from around the globe

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

### Solar plane lands in California

3 day flight across Pacific Ocean was done without any fuel [[TIME](#)]

### Beyoncé releases new album

12-song "visual album" called *Lemonade* is singer's first since 2013 [[TIME](#)]

### Federal agents shot at motel in Kansas

3 U.S. marshals shot at motel, which goes up in flames during the gun fight [[CNN](#)]

### Police begin manhunt in Ohio after family killed

8 members of the same family found murdered in 4 different locations, no motive has been established [[BBC](#)]

### Prince found dead in Minnesota home

57-year-old singer found dead Thursday, cause of death is unknown [[BBC](#)]

## Winners of Caltech-Occidental Student Concerto Competition shine with flute, piano, cello



Allen Robert Gross is the conductor of the Caltech-Occidental Symphony.  
-<http://smmiror.com/>

**CHLOE HSU**  
Page Editor

Each year, the Caltech-Occidental Symphony features winners from the annual Caltech-Occidental Student Concerto Competition. This year on March 6 and April 17, the three student winners were flutist Dorothy Pan, pianist Karlming Chen and cellist Shahar Amitay. Pan, a fourth-year student in the USC-Caltech M.D./Ph.D. program, played Carl Nielsen's "Flute Concerto" in the winter term concert. In April, Chen, a second-year Caltech graduate student in mathematics, performed Sergei Prokofiev's Piano Concerto No. 3, and freshman Amitay from Occidental College followed with Edward Elgar's "Cello Concerto in

E Minor." In addition to the three concertos by student winners, the programs also included two small opening pieces and Beethoven's Symphony No. 3, "Sinfonia Eroica". Allen Robert Gross, also the music director and conductor for the Santa Monica Symphony, conducted both concerts.

I was unaware of the concerto competition, and went to the concert in March for Beethoven's Third. As expected, Beethoven's "Eroica" Symphony alone was worth it, yet it was also a pleasant surprise to learn about the concerto series and hear Pan's performance. The opening was a short five-minute piece, Elgar's *Pomp and Circumstance* March No.4. The

*Continued on page 2*

## IN THIS ISSUE

OPINION | PAGE 3  
BOLTON EXPRESSES  
RESERVATIONS ABOUT  
METRIC SYSTEM

FEATURE | PAGE 4  
EDITORS' COLUMN:  
HAVING FUN DISCUSSING APPLIANCES

SPORTS | PAGE 5  
MORGAN HILL  
BREAKS 81-YEAR-OLD RECORD

OPINION | PAGE 7  
MEATLESS MONDAYS  
SPARKS DISCUSSION  
ON VEGETARIANISM

# Caltech Y Column: Upcoming news and events

## 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. 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.

### Upcoming Events

#### 1. Caltech Y India Cultural Trip - Applications Available Now

December 10 - 20, 2016 | Cost: \$950 | Applications Due Thursday, May 18th

The Caltech Y, in partnership with the SURF Program and IIT Gandhinagar (IITGN) in India, is coordinating a trip to Ahmedabad, India. Join us for an exciting trip as we explore India as an emerging nation and its potential role as a global leader in the context of its history and culture. The Caltech group will be hosted by IITGN and discussions and trips will be led by IITGN faculty.

The trip is open to undergraduate students only - sorry no graduate students. Applications can be found at [http://caltechy.org/programs\\_services/areas/India/index.php](http://caltechy.org/programs_services/areas/India/index.php) and are due by Thursday, May 18th. Questions may be directed to [caltechy@caltech.edu](mailto:caltechy@caltech.edu). Space is limited

#### 2. Sustainable Living Series

Chemicals and Cosmetics - Finding Greener Alternatives | Tuesday, April 26th

Food and Shopping for a Sustainable World | Thursday, April 28th

Both Sessions | 12:00-1:00 p.m. | Winnett Lounge

Sustainable Works, an educational organization that promotes sustainable actions to foster a safe, healthy and equitable world, will lead two seminars about how you can make your lifestyle more sustainable. These workshops will give perspective on shopping and using consumer goods, household chemicals, cosmetic products, and organic food and how they influence the environment. Come learn how your actions can make a difference.

Students, staff, and faculty are all welcome. Lunch provided on first come first served basis. The Sustainable Living Series is coordinated by Amanda Shing - Grad Student and 2015-16 Caltech Y ACT Award Recipient - and is made possible with generous support from The Caltech Employees Federal Credit Union and the Caltech Y.

#### 3. Caltech Y Centennial T-shirts

Pick your T-shirts up at the Caltech Y | All colors and sizes are now in stock | 505 S. Wilson

It's the Caltech Y's Centennial Year and we are celebrating with Caltech Y Centennial T-Shirts! The pillars of the Caltech Y are Service (purple), Adventure (green), Civic Engagement (red), Perspective (blue), and Leadership (grey). When you participate in any of our programs you earn that pillar's colored shirt (limit one color per person). Get one or collect all five colors.

Here is how you can earn a shirt...

Service: Make-A-Difference Day, Pasadena LEARNS, Hathaway Sycamores,

Union Station, Rise Tutoring, and MLK Service Day.

Adventure: Y-Hike Backpacking, Yosemite Camping, Joshua Tree Camping, Day Hikes, Kayaking, Adventure 101 lunches, Wilderness First Aid, and Alternative Spring Break Trips.

Civic Engagement: Washington DC Science Policy Trip, Science Policy Lunches, MLK Week Activities, Social Activism Speaker Series Lectures.

Perspective: World Fest, Explore LA Outings, Life Skills Lunches, Home Cooking Lunches, Community Service and Advocacy Fair, and the India Ki Khoj Trip

Leadership: attend a leadership program or join one of our leadership groups ExComm, Y-Outdoors, the Social Activism Speaker Series Committee, or be a Service Project Leader.



In honor of the Caltech Y Centennial, the Caltech Y is offering the opportunity to win T-shirts for participating in one of the many programs it offers.

Photo Courtesy of Caltech Y

#### 4a. Pasadena LEARNS

Friday | 3:00 - 5:00 p.m. | Madison, Jackson, and McKinley Elementary School

Come volunteer at Madison, Jackson, and McKinley Elementary School! We are partnered with the Pasadena LEARNS program and work with their Science Olympiad team or do regular tutoring along with occasional hands-on science experiments. Transportation is provided. For more information and to RSVP, contact Vansh Kumar at [vkkumar@caltech.edu](mailto:vkkumar@caltech.edu).

#### 4b. Hathaway Sycamores

Wednesdays | 5:30-8:00 p.m. | Highland Park

Volunteer at Hathaway-Sycamores, a group that supports local underprivileged students. There are a variety of ages and subjects being tutored. The service trip includes about an hour of travel time and 1.5 hours of tutoring. Transportation is included. For more info and to RSVP email Sherwood Richers at [srichers@tapir.caltech.edu](mailto:srichers@tapir.caltech.edu).

#### Other Announcements - Beyond the Caltech Y

##### Animal Magnetism

Monday, May 23rd | 5:30 - 8:30 p.m. | Brown Gym

Caltech's Center for Teaching, Learning, and Outreach is seeking volunteers to run activities and lab demonstrations at its community science event on Monday, May 23. The event will feature the lecture, Animal Magnetism by Joseph Kirschvink, professor of geobiology, focusing on earth's systems. More information on how to get involved in this and other future outreach events can be found at <https://csa.caltech.edu/cseVolunteer>.

# Caltech-Occidental Symphony features student winners in concert series

*Continued from page 1*

march did its job to open the concert with excitement, and at the same time the steady pace of the march kept the level of excitement controlled, leaving enough room for the climax. Following *Pomp and Circumstance*, Nielson's "Flute Concerto" was a novel experience. The concerto itself is neoclassical in style with only two movements instead of three, and it is a relatively rare opportunity to listen to a live flute concerto with a full orchestra. This seemed a challenging piece because of the intentionally unpredictable progression and the rapid dialogues alternating between solo flute and orchestra. After intermissions, Beethoven's Symphony No. 3 was an outstanding finale, as the conductor's radiant enthusiasm thrilled both the orchestra and the audience. Ever since then, whenever I picture Gross in my head, he is jumping up and down on the podium during the last movement of Beethoven's Third. If I were to describe Gross's conducting style in one word, it would be "energetic." Gross was not new to "Eroica" — he had conducted the symphony for the Santa Monica Symphony just two years ago. I believe Beethoven's Third was an excellent choice for the program, given his experience with the piece and his overflowing energy.

Left with an admirable impression from the first concert, I had been keeping an eye on the second concert and was certainly not disappointed. The opening piece, Carl Maria von Weber's "Overture" to *Der Freischütz*, did not give me many strong feelings, though

it was probably not the orchestra's fault. I remember zoning out for a moment, and by the time I regained my consciousness the overture had been over. Next up was Prokofiev's Piano Concerto No. 3. Prokofiev was one of the major composers of the 20th century, his reputation in the West was underrated during his life-time due to cold-war antipathies, and his Piano Concertos No. 1, 2 and 3 are some of his most popular works (also some of my favorite piano concertos).

Chen played the piano solo very well, even though unfortunately his piano parts were often overshadowed by the orchestra due to the acoustics in Ramo Auditorium. Finally, Elgar's "Cello Concerto in E Minor" was my favorite performance out of both concerts, and Amitay was my favorite artist. When I talked to several orchestra members after the concert, they all named this piece as their favorite as well. I think secretly the Caltech-Occidental Symphony always saves the best piece for the last in every concert. In addition to the superb music quality, Amitay's stage presence was remarkable. He interacted with the audience through facial expressions, and guided the audience to appreciate the concerto's rich emotions. As a freshman, Amitay is the youngest among the three student winners.

Overall, the variety of concerto instruments spiced up the concerts, and the Caltech-Occidental Student Concerto Competition performances have been a great delight. I would recommend next year's concerto series for anyone with a Sunday afternoon to spare.

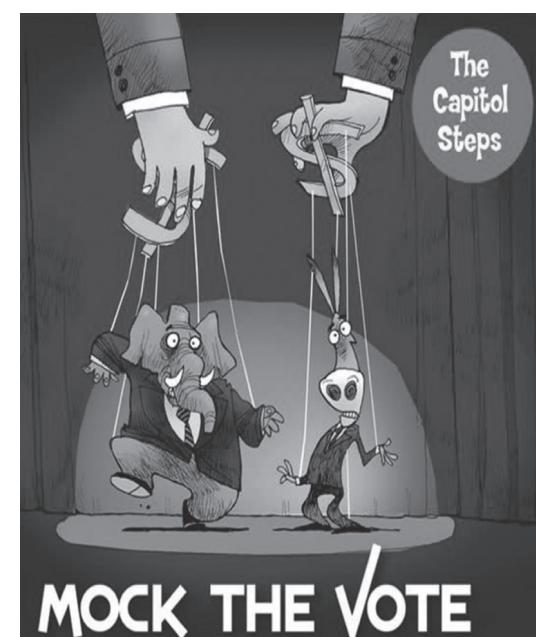
## Caltechlive!

SATURDAY, MAY 7, 2016 • 8 PM

SUNDAY, MAY 8, 2016 • 3:30 PM

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# A\$AP Ferg's sophomore album disappoints despite big-name collaborators

NAILEN MATSCHKE  
Contributing Writer

ASAP Mob has without a doubt been one of the most successful pioneers of this internet-driven age of hip-hop, and like similar collectives that rose to fame in the '10s, the explosive popularity of one member catalyzed the careers of the others. In ASAP's case, this was A\$AP Rocky, whose self-released debut scored him a record deal and the A\$AP Worldwide label, opening the door for his associates to release their own material. This, of course, gave us A\$AP Ferg, whose debut album *Trap Lord* was released in 2013 to a fairly positive reception. On it, he demonstrated not only his competence as a rapper with a good ear for complementary beats but also that he had his own style and wasn't just another Rocky. However, 2014's *Ferg Forever* mixtape, while not lacking in the oddly charming personality of Ferg's lyrics, was a far less cohesive project, even for a mixtape. It contained a wide variety of far more pop-influenced tracks, from festival bangers to attempts at '90s R&B to viral dance move vehicles, and while some were entertaining, others were half-baked, out of place and totally illogical for Ferg. These highlight his main weakness — that he's just not that technically skilled and needs engaging subject matter and a solid beat in order to produce an at all entertaining track. On Ferg's second album, *Always Strive and Prosper*, he continues to experiment with new sounds and flaunts an impressive list of collaborators, but the result is just as hit-or-miss as before.

In some respects, I think a rehash of *Trap Lord* with a higher production value and improved lyricism would have been a more satisfying album than what

*Always Strive and Prosper* turned out to be. While there are certainly some enjoyable tracks, the bad ones are just unrelentingly terrible, with either a Ferg that sounds completely out of his element or dated, cheesy songwriting. The album's first wild deviation comes on the third song, "Strive (feat. Missy Elliott)," which features cornily motivational lyrics, encouraging the listener to get up "and create your life / 'cause you're missing opportunities," on top of the bizarre choice of a DJ Mustard co-produced electropop beat so generic it would fit any Disney singer. If Ferg had generally incorporated more pop elements into the album, this track might have fit, but instead it's very jarring to hear him try to adapt to a completely different style, especially right after the high-energy, Skrillex-produced "Hungry Ham (feat. Skrillex & Crystal Caines)."

Then, toward the end of the album, is the atrocious "World Is Mine (feat. Big Sean)" with an atmospheric and somber beat that would do well with some deep verses, but instead we get Big Sean singing the same hook, out of tune, repeatedly, capped off by

## ALWAYS STRIVE AND PROSPER



-<http://consequenceofsound.net/>

an inevitably mediocre verse. With auto-tune showing up all over this album I can't fathom how no one thought to touch up Big Sean's voice, and even Ferg does a better job of singing, but Big Sean's performance is just the cherry on top of a disaster.

Still, I don't know if it's as viscerally revolting as "I Love You (feat. Chris Brown & Ty Dolla \$ign)" two tracks later, which has short, simple verses serving as nothing but a ferry between comically dated Chris Brown choruses, so aesthetically disconnected from the rest of the song that it feels like a feature for the name recognition only. Clearly some of the ideas that made it on to this album should have been reconsidered.

To make matters worse, only a handful of the redeemable songs on *Always Strive and Prosper* do much to compensate for the creative black holes in the track listing. It was very easy to tell which were produced by all-stars like Skrillex, Lido and Cashmere Cat, Lex Luger, and Clams Casino, whose tracks I generally liked, since the other beats were so bland and devoid of character. "New Level (feat. Future)" comes to mind as the worst offender in this regard, with the same short bass pattern repeated for four minutes straight as the only melody, sounding like a phoned-in attempt to copy a typical Future beat, which does anything but make his featured vocals more interesting. "Uzi Gang

(feat. Lil Uzi Vert & Marty Baller)" is another offender, with a bass-heavy, plodding skeleton of a beat that serves no real purpose except as a background for the repeated "Who they want? Uzi Gang, ASAP" hook with some very disjointed transitions.

Some of the other tracks with features are a bit more tolerable, though "Swipe Life (feat. Rick Ross)" is literally about Ferg and Rick Ross buying things with credit cards, and ScHoolboy Q brings a much stronger verse than his host on "Let It Bang (feat. ScHoolboy Q)." Even with 18 tracks, the album doesn't leave itself much space for decent material, and the quality mostly boils down to whether the song was produced by a big name and whether its concept meshes with Ferg's abilities; the rest are filler at best, borderline unlistenable at worst.

Perhaps the simplest way to describe A\$AP Ferg's *Always Strive and Prosper* is to say that it has a lot of problems. To start with, only a handful of tracks are entertaining and memorable, but it's the rest that really drag the album down. Many of the vocal features are either underwhelming or predicated on Ferg venturing so far out of his comfort zone that the results are messy and hard to take seriously. In the worst case this manifests itself in pitiful attempts to copy '90s R&B or contemporary pop artists, but in general the album does little to showcase Ferg's talent or creative vision. I would recommend that people interested in checking this album out simply look up its credits on Wikipedia and only listen to the songs by their favorite producers. Just about every other aspect of *Always Strive and Prosper* is disappointing, and the album is not something I ever intend to revisit.

## Bolton Rants: The metric system is completely useless

BOLTON BAILEY  
Contributing Writer

*Editors' note: Obscenities have been edited or removed.*

As Americans, we have inherited the use of imperial units, which are [useless], as we all know. Twelve inches to a foot, but only three feet to a yard, three teaspoons in a tablespoon, which is also half a fluid ounce — what!???

*Principle 1: Any base system greater than 17 is too hard to learn*

When we learn addition and multiplication tables, the number of arithmetic operations a young student must learn scales with the square of the number of addends or multiplicands. For a 12x12 table (the current usual maximum as we discussed), we must learn 144 products. I'm going to say that any size greater than about twice this is unreasonable. Thus 288, which is about 17 squared is our maximum.

*Principle 2: Any base system less than 5 isn't useful.*

The simple reason for this is that the number of digits needed to represent a value n is given by  $\log_b n$ . A base 4 system would require 60% more digits than base 10.

*Principle 3: A base system should be a power of two*

This is because all modern computational machinery use a base two system. A base system which is a power of two makes it easy to translate back and forth between bit encoded numbers and natural digits.

This leaves us with 8 and 16 as our two possibilities. We make one further observation.

*Principle 4: A base system which is of the form  $2^{(2^n)}$  is, all else equal, superior.*

This is because we can make the byte size for standard computer architectures  $2^{(2^n)}$ , at which

point we can index into a byte for bit masking operations with a single symbol, which can then be represented with n bits. 16 satisfies this, and has the additional benefit of being of the form  $2^{(2^2)} \cdot 2^{(2^2)}$ , which can be represented as  $2^{(2^4)}$ , or  $2^{(2^2)^2}$  in up-arrow notation.

So we have established base 16 as the superior base system. From this point on, we will represent all numbers in base sixteen, and we will refer to all units as American units.

### SECTION 2 — UNITS OF TIME

We come to a crossroads where we must choose whether or not to use Planck units as our basic units. While Planck units may be useful for theoretical physicists, the unfortunate fact is that we would like our units of time to be in a power of 10 ratio to the length of a day. A day is 1.19 times 10 to the 28,

so this makes it very inconvenient to represent time in Planck units.

So we now consider a times close in magnitude to a traditional second. A day is 15180 traditional seconds, so the nearest choice is to make an American second be  $1/10000$  of a day. This means an American second will be slower than a traditional second by the factor of 1.518, not a major change.

We can now let an American minute be 100 American seconds and an American hour 10 American minutes, longer than traditional units by factors of 5.4 and 1.8, so that a day is 10 American hours.

We can then represent times of day with the clear notation H:M:SS, wherein every symbol is equally likely to be used, leading to better information-representational economy. The issue of an American minute being about 5 times longer than a traditional minute is really

*Continued on page 7*

## Editors' Column: Thoughts on random household appliances

### TECH EDITORS

#### Katherine: Drying Laundry

I love the entire process of drying laundry. With our newfangled drying machines, we can cram wet clothes into a metal box's gaping mouth-hole and, in about an hour, out comes happy, toasty laundry. But my romantic side longs to daintily string up my wet fabrics and meticulously attach clothespins to each. I think that the vision of a quaint cottage in the hills with beautiful, white bedsheets drying on clotheslines is the most romantic thing. One of my fantasy lives is being a girl living in the countryside. I like to close my eyes and imagine the sun shining on me as I, a young prairie girl, dutifully hang up the family's laundry. My laundry basket is clasped to my hip, and I wipe the sweat from my brow with

a pink, checkered handkerchief. I take a good, hard look at the snow-white sheets fluttering in

the playful breeze, the sun shining hard on my back. A small, fluffy fox terrier chases its tail next to

me. I look serenely in the distance, idly watching two young children play in golden meadows. Then I look back at my laundry lines and I realize literally every piece of flying outdoor detritus is getting stuck in my freshly cleaned clothes.

#thatsmyfetish

#### Chloe:

#### Microwave Phobia

I have a family history of microwave phobia. Symptoms include the compulsion to run away from a microwave after hitting the start button and the vision of brain cells turning into cancer cells whenever watching a microwave in action. OK. I believe in science. I know it's all in my head, and I rationally think microwaves are safe. Yes, but

I still have this instinctive fear of microwaves even though I learned in Chem 1A that a microwave produces thermal energy by inducing polar molecules in the food to rotate, and even though I have faith that the protective chamber is coarser than visible light wavelength but finer than microwave wavelength.

**Disclaimer:** Despite all that being said, I still use microwaves almost every week because Caltech is sometimes too darn busy.

#### Neera: Vacuums

First, as a somewhat tangential observation, I'd like to point out that the durability of many current appliances pales in comparison to that of their older counterparts.

For example, I have a washer and dryer at home that are still fully functional, and both are more than 24 years old. I don't know how many of you have new washers and dryers, but most other people I know who have bought them in the last 10 years have encountered more problems than I ever have with my old set. I also don't like having to get new things if I don't have to ... so, as you can guess, it was rather disappointing having to cycle through several vacuums after the first one I remember having at home broke. I still remember: it was a Eureka black vacuum with a bag. (How many of you even remember having a bag in your vacuum?)

Currently, I'm rather partial to Dyson vacuums. The Eureka vacuum lasted for a good eight years or so. After that, we were cycling through vacuums every one or two years — sometimes even as short as six months. I learned that any vacuum made by Dirt Devil is more a smelly devil made of dirt, rather than a clean adversary of the dirt itself. Maybe the technology of bagless vacuums just took a while to get perfected, but going seven years without a reliable vacuum was frustrating. Then, in 2009, I discovered the glory that is the Dyson DC33. Powerful suction, easy to clean filter, several attachments, not too heavy, no smell, very durable — the DC33 has it all.

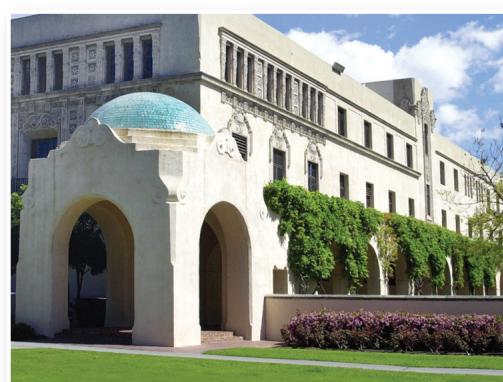
Now, I recently became aware that apparently Shark is a worthy competitor. When considering budget-friendly options, the Shark models definitely beat out Dyson. A brief search of online pricing shows that Shark vacuums that are less than \$400 can easily be found, while Dysons tend to go for \$400-\$600. If you're looking for variety, though, Dyson has a larger selection of models — the company even launched a special line for pet owners.

If anyone has had a good Shark vacuum for at least seven years, let me know and maybe I'll try one out sometime. Otherwise, my Dyson and I are perfectly happy.



-http://www.publicdomainpictures.net/

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# SPORTS

THE CALIFORNIA TECH

APRIL 25, 2016

5

## Hill shatters 81-year-old record, men top Whittier at SCIAC #3

GOCALTECH.COM  
Actual Sports Content Editor

REDLANDS, Calif. (Apr. 16, 2016) – Senior Morgan Hill shattered an 81-year-old record and sophomore Alex Bourzutschky recorded an incredible four personal bests as Caltech men's track & field defeated Whittier College, 73-68, while junior Lucy Chen cracked another women's Top-10 list on Saturday.

Having also beaten Chapman University for the second straight season, the Beavers have recorded a pair

of dual victories for the first time since 2007. Six Beavers and both relays earned first-place points in the dual scoring vs. Whittier, led by a pair of maximum earners in senior Edward Garza and freshman Ben Calvin.

"The day before the meet, we discussed trying to feed off of each other's performances," Head Coach Ben Raphelson said. "We felt that could carry us to a strong team effort."

Continuing his stunning development throughout his senior year, Hill launched the hammer yet another two meters past his career-best mark from just last week, blowing past the record set by Robert Parker back in 1935. Hill's mark of 158 feet, two-and-a-half inches was less than four inches from winning his second dual meet title of the spring and maintained his hold on the fifth-best mark in the SCIAC. He also bettered his personal record in the discus to cap the historic day.

## Beavers toss gems in tight Whittier series

GOCALTECH.COM  
Actual Sports Content Editor

WHITTIER, Calif. (Apr. 16, 2016) – Junior Kai Kirk and sophomore Garrett Levine pitched a pair of gems in the Saturday doubleheader as Caltech baseball gave Whittier College all it could handle in a three-game SCIAC series this past weekend.

Just 18 hours after hanging in the series opener through seven innings, the Beavers rallied behind their two best pitching performances of the season. Kirk surrendered just three earned runs over 7 2/3 innings pitched, marking the fourth start in his last five that the junior transfer has limited the opposition to four or fewer earned runs. His ERA over that span of 31 1/3 innings checks in at 5.46, which over a full season would be the lowest in program history. Levine

"It was a lot of fun to see Morgan break the record and the team was very excited for him," Raphelson said. "It was validating for him and the work he has put in, but we also recognize that the season is not over."



Stop! Hammer time! Can't touch this (new school record)!

-http://gocaltech.com

After weeks of steadily approaching the program's long jump Top-10 list, Chen finally just made the cut with an improvement of three inches for a leap of 14 feet, five-and-a-half inches. She also ranks fifth on the triple jump list.

Garza blazed past both his personal best times in the 100- and 200-meter dash, albeit with significant wind assistance exceeding the legal limit in each. He clocked significant drops to record an 11.34 in the 100m and a 22.80 in the 200m. Calvin dropped .42 in the 110-meter hurdles (18.94) and debuted in the 400m hurdles, timing in at 1:09.13 to complete his sweep of first-place finishes in the dual scoring.

Seniors Kevin Yei and Anup Kishore, sophomore Chris Haack and freshman Rohan Doshi also notched maximum points in one event apiece. Yei trimmed .16 from his season-best time in the 400m, Kishore moved another step toward his pre-injury form with another foot improvement in the

triple jump (38 feet, two inches), Haack crossed the line in the 5k at 19:26.77 and Doshi shaved almost a second in the 800m (2:01.51). Both the 4x100 (47.16) and 4x400 (3:43.27) relays posted season-best times and brought in top points as well.

Bourzutschky clocked a major career-best time in the 200m (23.82), dropping three-quarters of a second from this season's top time and sneaking under his previous PR by .11, along with a new top mark in the pole vault at 10 feet, six inches while running legs on both

relays. Sophomore Gene Vaughan earned second-place points in the 5k (19:32.27) along with freshman Rohan Choudhury in the 800m (2:08.40), while junior Teddy Hu edged out Whittier's lone runner in the 400m by half a second (1:03.94). Choudhury also posted a PR in the 1500m (4:11.93), with freshman Joey Hong recording a 2:09.50 in the 800m and Kishore improving another two-and-a-half feet in the discus (63 feet, five and three-quarters inches).

Freshman Muskaan Goyal and junior Lilly Luo completed the near-perfect record of personal bests on the day. Luo trimmed a second and a half in the 1500m (5:49.56) and timed in at 2:56.23 in the 800m while Goyal edged out Whittier's only sprinter in the 100m and registered a massive improvement in the discus by nearly four meters (64 feet, 10 inches).

"After such a successful day, we're excited for what's in store for the entire program," Raphelson said.

lasted a season-high 7 1/3 innings, allowing a season-low two earned runs on eight hits and three walks while whiffing four.

### Caltech 5, Whittier 9

The Saturday doubleheader began with five scoreless half-innings before Whittier tacked on the first run after loading the bases with two outs in the first. Three consecutive leadoff singles loaded the bases with none out in the bottom of the third, but Kirk did well to limit the damage to a sacrifice fly sandwiched between a strikeout and infield pop-up.

Caltech struck immediately to take the lead as freshman Mark Burleson smacked a two-RBI double to score Levine and Menninger following a walk and double, respectively.

Kirk kept the Beavers in front with a 1-2-3 fourth inning and Watson plated another run on a

groundout after Jared Reed had led off reaching via error. The Poets tied things up with a pair of runs on three singles, a walk and a sacrifice fly in the fifth, but Daniel Chou caught the batter trying to advance to second on the throw to end the inning before any more damage could be done.

Following a leadoff walk to Tim Menninger in the sixth inning, a sacrifice bunt and fly out moved the junior over to third base, but another fly out to left field ended the frame. Kirk erased a leadoff walk to Whittier with an inning-ending double play but the Beavers were sat down in order in the top of the seventh, allowing the Poets to jump back in front with two unearned runs in the bottom of the inning. Whittier added four more in the eighth to render a two-RBI double by Chris McCarren in the ninth ineffective.

## Pathireddy, Nguyen notch historic regional win at No. 15 Redlands

GOCALTECH.COM  
Actual Sports Content Editor

PASADENA, Calif. (Apr. 16, 2016) – Junior Ruthwick Pathireddy and freshman Derik Nguyen scored an historic regional upset over the West No. 15-ranked doubles team of national No. 15 University of Redlands on Saturday morning.

The regional victory marked the Beavers' first in at least the last five years, likely extending as far as the last decade and possibly beyond.

All three Beavers duos put up incredible fights against the deep and talented Bulldogs pairings. No court was separated by two games at any point until Redlands' West No. 3-ranked team came up with a break on the final changeover at #1 for the 8-6 victory. Meanwhile,

as the Bulldogs took control with a break at #3 to lead 6-5, Pathireddy and Nguyen did the same to go up 7-6 at #2. Redlands would take #3 doubles, 8-5, just moments before the Beavers sealed the victory with a break in the final game at #2, 9-7.

Redlands quickly took the first set at four courts and led by a break at #3, but freshman Zixiao Li held his ground at #5 and stole the first set, taking the final two games. In his first match at #3, freshman Andre Liu nearly rallied from a 6-2 defeat in the first set before succumbing, 7-5, shortly after the Bulldogs clinched the match with wins at #1, #6 and #4. Li continued to fight, however, dropping the second set 6-3 but surging ahead in the superbreaker to post the 10-4 victory.



This looks like a super intense movie poster. "In a world where beavers run free, one rogue tennis ball threatens to upset life on the court. Our only hope — Ruthwick and his racquet."

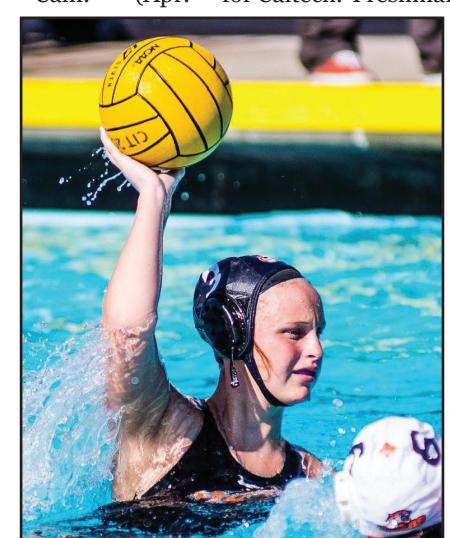
Photo Courtesy of Michael L. Wong

## Johnston nabs third hat trick against DIII No. 4 Chapman

GOCALTECH.COM  
Actual Sports Content Editor

PASADENA, Calif. (Apr.

16, 2016) – Freshman Katie Johnston converted all three shot attempts for her third hat trick of the season as Caltech women's water polo fell to Division III No. 4 Chapman University on Saturday morning in the final game before the SCIAC Championships.



The psychedelic corn snake slithers around her opposition.

Photo Courtesy of Michael L. Wong

The Panthers surged ahead to a 12-0 lead at halftime before Johnston took things into her own hands, netting three straight Beavers goals midway

through the third quarter and early in the fourth before classmate Brittany Percin notched another for Caltech. Freshman Hana Keller joined the rookie duo in the scoring column with her first career goal as the fourth quarter wound down to a 20-5 Chapman win.

The Beavers bid farewell to a trio of seniors who played in the final home game of their careers — Alexandra Ilic, Soumya Kannan, and Stephanie Wong.

# ASCIT Minutes

Meetings are every Wednesday at 4 p.m. in SAC 13

## ASCIT Board of Directors Meeting

Minutes for 21 April 2016. Taken by Phillip An.

**Officers Present:** Nima, Serena Delgadillo, Sean McKenna, Kalyn Chang, Annie Chen, Robin Brown

**Call to Order:** 12:05

### President's Report (Nima):

- Schedule for transition:
  - Still will attend Joe Shepard Meetings and committee meetings until June

### Officer's Reports:

- V.P. of Academic Affairs (ARC Chair: Jay):
  - Absent
- V.P. of Non-Academic Affairs (IHC Chair: Bobby):
  - Absent
- Director of Operations (Sean):
  - Will fix ASCIT screening room projector in Hawthorne soon
- Treasurer (Kalyn):
  - None
- Social Director (Annie):
  - Trivia night is tonight! (every other Thursday until Week 8)
- Secretary (Phillip):
  - None

If anyone has any questions or concerns about a section of the minutes please email the appropriate officer. We are happy to answer any questions. The next meeting will take place on **April 28<sup>th</sup>** at **12pm** in **Winnett Lounge**.

**Meeting Adjourned:** 12:27 pm

## REMINDER FROM COUNSELING CENTER:

### Meditation Mob

(drop-in mindfulness meditation group)

Meets every Tuesday  
12:00-12:50 p.m.

Bottom floor of Winnett

## VICE PROVOST'S OFFICE HOURS

Vice Provost, Chief Diversity Officer and Professor of English, Cindy Weinstein, holds regular office hours. This is an opportunity for undergraduate, graduate students and postdocs to meet and discuss what they'd like pertaining to the Council on Undergraduate Education, Caltech accreditation, the Staff and Faculty Consultation Center, Student-Faculty Programs, the Center for Teaching, Learning and Outreach, the Caltech Diversity Center and the libraries.

There are four appointments per hour, 15 min. each. Sign up the morning of the office hour in 104 Parsons Gates, Vice Provosts' Offices (x6339).

### Spring Term Office Hours

**12 p.m. - 1 p.m.**

*Tuesday, April 26*

*Friday, May 6*

*Thursday, May 12*

*Wednesday, May 18*

*Tuesday, May 24*

*Friday, June 3*

*The California Tech*

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Letters and submissions are welcome; e-mail submissions to [tech@caltech.edu](mailto: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 p.m. 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](mailto:tech@caltech.edu). For subscription information, please send mail to "Subscriptions."

## Caltech Public Events Hiring Ushers

**Flexible hours.**

**No experience needed.**

**Outgoing Personality.**

**Pay Rate:**

**\$15 per hour**

## Caltech Students only!!

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**626.395.5907**

**[ajacobo@caltech.edu](mailto:ajacobo@caltech.edu)**

## In response to Meatless Mondays: On vegetarianism and veganism

NEERA SHAH  
Page Editor

In response to an op-ed published in The California Tech last week about Meatless Mondays, I want to continue the conversation about vegetarianism. I think the idea of Meatless Mondays is a good one, especially when considered as a step to take as part of a larger plan. What this larger plan is can vary, but the two most common ones are probably directed toward self-improvement (in terms of health and/or morality) and helping the environment. These motivations lend themselves to a lengthy discussion best left for another time, though.

As Kristie Middleton said in last week's article, there are environmental benefits of vegetarianism. Veganism, however, goes a step beyond vegetarianism: it advocates against the consumption and use of any animal products. Some of the more obvious differences include not eating dairy and eggs, but lesser known substances that vegans refrain from eating/using include honey and wool.

I am a vegetarian and have been my whole life for religious reasons. So, while I cannot speak to how it feels like to make a transition to vegetarianism, I do understand that it can be difficult. It is easy to judge people for doing something they've always done when you've never faced the conflict yourself. When I was younger, I used to assume that giving up meat should be rather easy, since I never eat meat and do not feel like I am missing out on anything. But my perspective completely changed after thinking about veganism. I began to imagine how someone could live without dairy, since almost every meal I eat contains some form of dairy. I admit, it would be very hard for me to become vegan because I am so accustomed to a vegetarian diet.

That said, it's not impossible or even out of reach to make such a lifestyle change. All it takes is some conscious effort and small steps. This brings me back to Meatless Mondays: this is a great opportunity to take a step toward becoming vegetarian. Similarly, cutting out products such as eggs from your diet can be a step towards becoming vegan if you are already a

vegetarian. Drastic change will not happen overnight. Going all-or-nothing can be an appealing idea in our heads, but larger changes often involve taking a couple steps to get to the "all." Nobody wants to compromise, but it's necessary for progress in some situations. Meatless Monday can help you get to "Meatless Everyday."

If anyone is interested in becoming a vegetarian or vegan, a good starting place is often talking to someone who currently follows that lifestyle. However, it is important to keep in mind that not everyone is fully informed. There are plenty of resources online for finding vegetarian- and vegan-friendly recipes as well as information on nutrition and different reasons for following each lifestyle, such as <http://www.vrg.org/www.vrg.org> (The Vegetarian Resource Group). And even if you're not interested in changing your diet, have conversations about these ideas anyway. At the very least, you'll be informed and better able to understand another person's perspective.

## Bolton proposes an alternative to the metric system

*Continued from page 3*

American week. The work week will be C days long followed by a four-day weekend. Months will be discontinued as a unit of measure and time periods on the order of months can be represented in terms of American weeks.

Instead of the concept of a year that tracks the seasons, we have an American year, which will be 10 weeks long. This way there are 100 days in a year, for easy scheduling of holidays. The school system can vary the summer vacation period from year to year - not really an inconvenience since the day of the year when school starts or ends already varies. This completely circumvents the problem of leap years. We shall identify year 0 as being the year starting at the moment of the UNIX epoch. Making the current American standard time, as of this writing,

413/A - E:4:D8.

**SECTION 3 — F--- THE GREGORIAN CALENDAR**

Reentering now the irrationally enraged part of our minds, what is the deal with the Gregorian calendar? I wasn't there when Pope Gregory was deciding this but it probably went something like this. (In base A for historical reasons).

"Hmmm, I'll have the first month be 31 days, then the next one be 28, then the next one 31 then 30, 31, 30, 31, 31, 30, 31, 30, 31. And just to make it fun I'll make the second month 29 days in years divisible by 4. But I'll make an exception, so that every year divisible by 100 is a normal year. But wait, I know! I'll make an exception to the exception so that every year divisible by 400 is a leap year again. Hooray! F--- you, Posterity!!!!!!!" - Pope Gregory XIII"

So, America, time to cut the [crap]. Here's what we are going to do:

Instead of an awkward seven-day week, we will adopt a system where there are 10 days of the

We will adopt tau as the circle constant. In addition to being a more natural choice, it also means that America's circle constant will be twice as big as the rest of the world. Suck it, pi-loving fascists!

6.487ED...

That's all for now.

-Bolton

## Crossword

### Across

1. Large and scholarly book
5. Personnel
10. Halt
14. At a later time
15. Mistake
16. Starchy tuberous root
17. Trudge
18. Comparative of bad
19. Panache
20. Sweet sticky liquid
22. A portion of medicine
23. Depend
24. Regret
26. Broaden
28. Changeable
32. Brine-cured smoked salmon
33. Block of writing paper
36. Similar
37. Chart
39. Misapply
41. Capture
43. Distilled from fermented molasses
45. Theme
46. Not awake
48. Also
50. Recreational facility
51. Very small
52. Any high mountain
54. Movie advertisement
56. Sedate
58. Used to control a horse
59. Reverberation
62. Small fastener
64. Jewish spiritual leader
68. Dreary
69. Part of a church
71. Golf club
72. Bloodshed
73. Relative magnitude of two quantities

74. Row or line of people

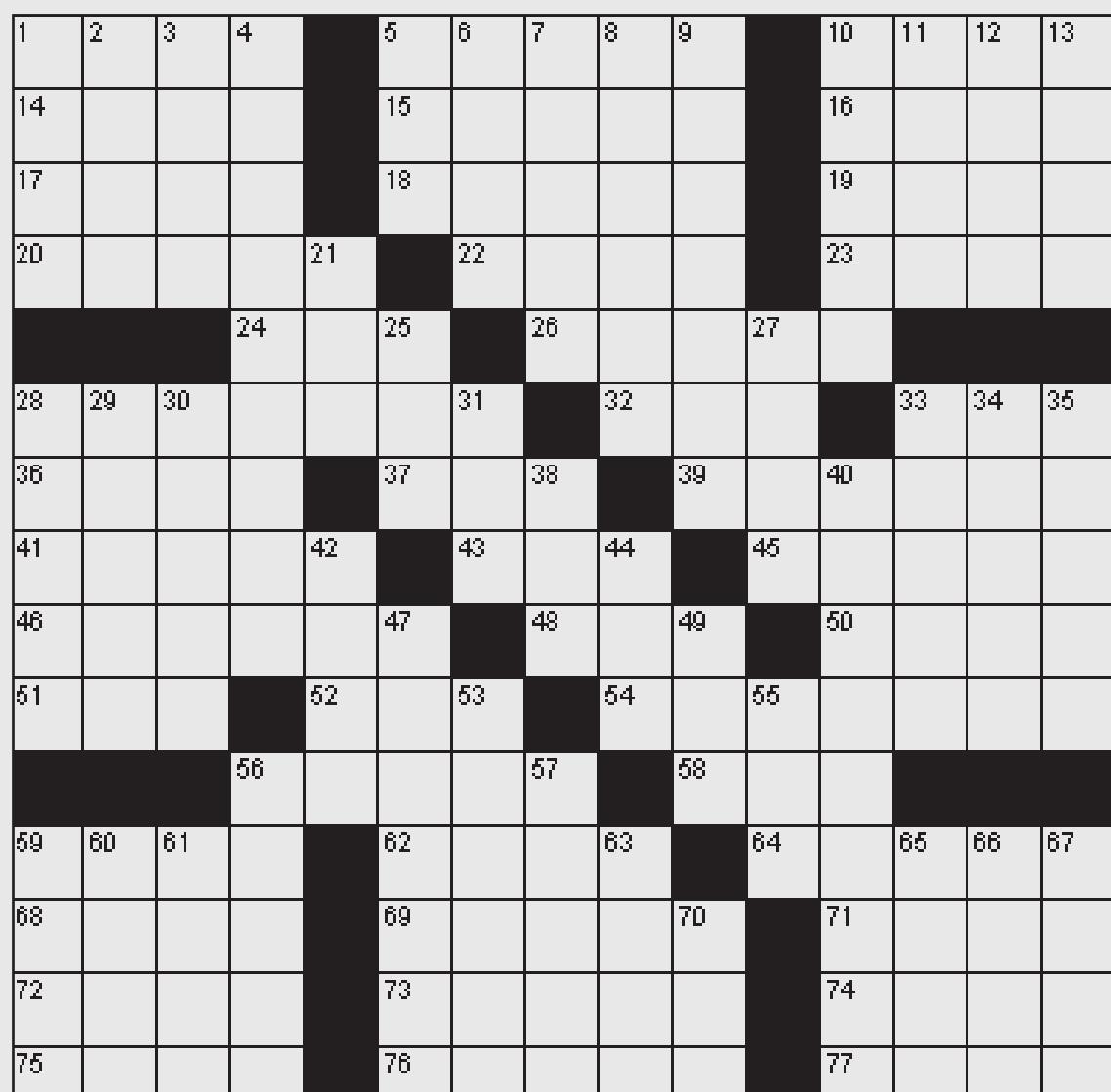
75. Pitcher

76. Stingless male bee

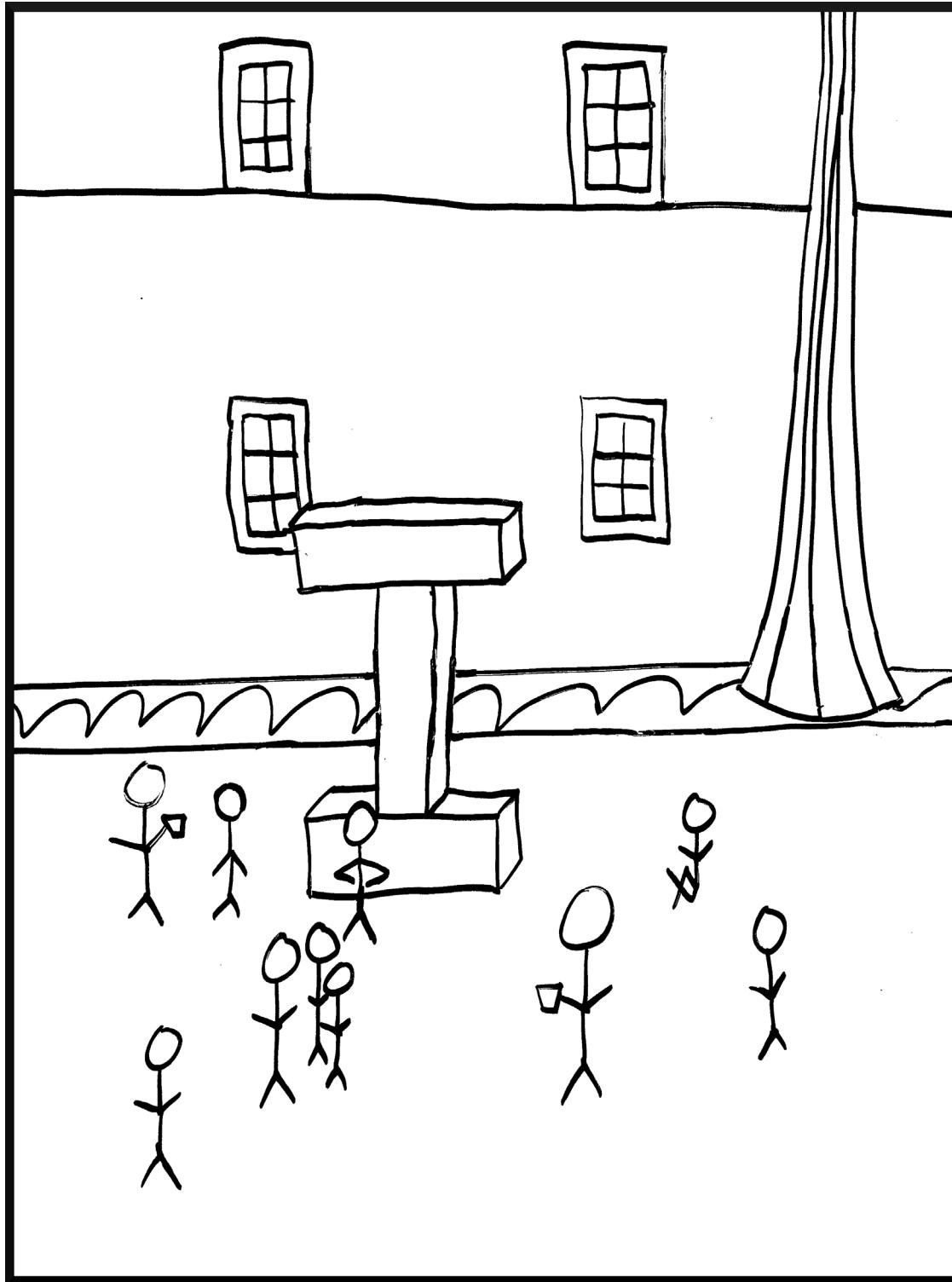
77. Mini whirlpool

### Down

1. Military lights out signal
2. Merely
3. Dock at a wharf
4. Power to withstand hardship or stress
5. Darn
6. Trampled
7. Pointer
8. Remains from a past age
9. Liberty
10. Austere
11. Story
12. Examination by word of mouth
13. Small horse
21. Tavern
25. Hard tough wood
27. Way out
28. Long-tailed parrot
29. Edict
30. Heading
31. Sense organ
33. Student
34. Stage whisper
35. Interior furnishings and design
38. Place
40. Game for one
42. Warmth
44. A clever remark
47. Advertising sign
49. Sphere
53. Column
55. Atmosphere
56. Not intoxicated
57. Repeat an action or statement
59. Surface boundary



## Sanity Considered Harmful

*p-adic Larson*

Contrary to popular belief, the old Big Interhouse parties were actually cancelled after, in an embarrassing show of laziness, each of the 7 houses built nothing but a big letter "I" in their courtyard.

Monday Punday



This picture represents a common phrase, title, or person.

Think you know the answer? Take a guess at [mondaypunday.com/150](http://mondaypunday.com/150)

Answers to current crossword (p. 7)

E	W	E	R	D	R	O	N	E	E	D	D	Y	
G	O	R	E	R	A	T	I	O	R	A	N	K	
D	R	A	B	A	L	T	A	R	I	R	O	N	
E	C	H	O	C	L	I	P	R	A	B	B	I	
W	E	E	M	S	T	A	I	D	B	I	T		
A	S	L	E	E	P	A	L	P	T	R	A	I	
C	A	T	C	H	R	U	M	T	O	P	I	C	
A	K	I	N	M	A	P	M	I	S	U	S	E	
M	U	T	A	B	L	E	L	O	X	P	A	D	
R	U	E	W	I	D	E	N						
S	Y	R	U	P	D	O	S	E	R	E	L	Y	
P	L	O	D	E	R	R	O	R	T	A	R	O	
A	N	O	N	S	T	A	F	E	S	T	O	P	
T	O	M	E	W	W	O	R	S	E	E	L	A	N

-<http://puzzlechoice.com>

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