

The California Tech

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PASADENA, CALIFORNIA

TECH@CALTECH.EDU

APRIL 10, 2017

Caltech Y Hosts Make a Difference Day 2017



Caltech students participating in various Make a Difference Day activities

Photos courtesy of the Caltech Y

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Caltech Y Column

CALTECH Y

Upcoming Events

Mentoring For Life

Mondays | 3:30pm | Wilson Middle School Pasadena

Stressed out by college life? Step outside the Caltech bubble and mentor tweens who've never even thought about college. Things you could do: Build a baking soda and vinegar volcano, read a book aloud, play sports or board games, teach the alphabet of another language, do a craft. Having a mentor makes an at-risk student 55% more likely to attend college, 78% more likely to volunteer regularly, and 130% more likely to hold a leadership position. Interested? If you have 180 seconds, you can watch this video and be inspired. If you have an hour a week, you can mentor someone and be their inspiration. If you feel unqualified, don't worry. Ultimately, mentoring is about being a consistent, dependable friend—not a surrogate parent or psychiatrist. To get started, contact noelle@caltech.edu.

The Caltech Y Social Activism Speaker Series Presents: Bridging the Divide: Scientists talking to the Media

A conversation with Ron Lin, journalist at the LA Times

Tuesday | April 11th | 12:00 Noon to 1:00pm | Location to be announced | Lunch is provided, spaces are limited

RSVP Required: <https://goo.gl/forms/eoZx1xRFJbzqezG53>

The Caltech Y Social Activism Speaker Series is hosting the first event in its Bridging the Divide series with Ron Lin, metro reporter at the LA Times. He will talk and take questions about how scientists can better communicate with reporters, what journalists look for and the need to make a compelling article and anything else on your mind.

Rong-Gong Lin II is a metro reporter for the Los Angeles Times and has written extensively about earthquakes. In 2013, Lin and other Times reporters wrote about the problem of brittle concrete buildings in Los Angeles -- how scientists, engineers, and city officials have long known about a flaw that could cause concrete buildings to collapse in an earthquake, yet little had been done to alert the public of this danger or require that this defect be fixed. Following the publication of the story, Los Angeles leaders passed the nation's most sweeping seismic regulations, requiring not only concrete buildings but wood-frame apartment buildings to be retrofitted, which will affect about 15,000 buildings in Los Angeles. The story was a finalist for the Online News Association's Knight Award for Public Service, the Scripps Howard Foundation's Ursula and Gilbert Farfel Prize

for Excellence in Investigative Reporting, and the Gerald Loeb Awards for Distinguished Business and Financial Journalism. A San Francisco area native, he graduated from UC Berkeley in 2004. Visit <http://www.latimes.com/la-bio-ron-lin-staff.html> for more details.

Your world awaits... will you act?

The Caltech Y Advocating Change Together (ACT) Award

Applications are due by Friday, April 21st no later than noon. Visit www.caltechY.org/programs_services/commservice/ACT/index.php for applications and more information.

Optional Info Dinner – Tues. April 11th - 6 pm - Hosted By Tom Mannion. RSVP by April 7th to <http://tinyurl.com/Y-Awards>

Got an issue or cause that warrants attention? Explore the issue - by attending a conference, training, or workshop, or choosing to immerse yourself with a mentor or organization that is addressing your issue – then plan some programs to raise awareness on campus. Awardees can receive up to \$4500 to cover expenses for their educational experience, including registration and program fees, travel, lodging, food, and incidentals.

Local, national, or global travel - as well as one day, multi-day, and even multi-week experiences - are all eligible. The Caltech Y ACT Award, made possible with generous support of the Caltech Employees Federal Credit Union, offers students an opportunity to pursue an issues through service or advocacy.

Stop by the Caltech Y or contact us to learn more about this exciting opportunity! Contact Greg Fletcher gregf@caltech.edu or Liz Jackman ljackman@caltech.edu for more information.

The Studenski Memorial Award

Proposals are due Friday, April 21st no later than noon

Visit www.caltechY.org/programs_services/areas/Studenski/index.php for proposal guidelines

Optional Info Dinner – Tues. April 11th - 6 pm - Hosted By Tom Mannion. RSVPs by April 7th to <http://tinyurl.com/Y-Awards>

Are you wondering about the next step in your life? Have you reached a crossroad where you would benefit from an opportunity to explore? Would a trip, an opportunity to volunteer with an organization, or a chance to try a new skill or interest this summer help you gain clarity? If you answered yes to any of these questions, then the Studenski Award might be for you.

The Studenski Memorial Award is a grant of up to \$6000 established in the memory of Paul Studenski, a Caltech student who was killed

Caltechlive!

Saturday, April 15, 2017 • 8 PM

BELLA GAIA (BEAUTIFUL EARTH)

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This show combines NASA satellite imagery of Earth with stirring live performances of music and dance from around the world.

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in an automobile accident while traveling across the United States in 1974. It is awarded to a Caltech undergraduate who, having reached a crossroads in life, 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.

Studenski proposals (1 to 2 pages maximum) are due Friday, April 21st no later than 12:00 noon to caltechY@caltech.edu (in word format). Contact Athena Castro athena@caltech.edu or Greg Fletcher gregf@caltech.edu if you have questions.

Hathaway Sycamores

Every Wednesday | 6:00 - 8:00 PM | Highland Park

Volunteer at Hathaway Sycamores, a group that supports local underprivileged but motivated high school 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. Eligible for Federal Work Study.

Caltech Y Spring Friends Dinner with Dr. Charles Elachi

"The Golden Age of Exploration"

Thursday | April 20th | 6:00 PM | The Athenaeum | \$85 pp

Please join us for our upcoming Friends Dinner with our guest speaker Dr. Charles Elachi who will be speaking on the topic:

"The Golden Age of Exploration"

JPL missions have visited every planet in our Solar System. Over the last fifteen years, three rovers have explored Mars in coordination with a number of orbiters. Samples have been brought back from a comet tail and the solar wind. Saturn and its satellites have been studied extensively with Cassini. Planets around neighboring stars were discovered. Many new insights in our planet's environment have been acquired.

Dr. Elachi will describe, from first-hand experience, the excitement and impact of these discoveries and the challenges and risks for the next 15 years.

Limited spots available, please call the Caltech Y office on 626 395 6163 to secure your seat! or sign up online here.

Building Cathedrals and Starships at Caltech

Timothy Liu
ARC Chair

Change can be slow at Caltech, demanding patience, persistence, and good documentation from students.

On August 15th, 1248, Archbishop Konrad von Hochstaden laid the foundation stone of the Cologne Cathedral. When completed, the Cologne Cathedral became the tallest twin-spired church in the world, standing 515 feet tall. Today, it is a World Heritage Site and the most visited landmark in Germany. Sadly, Konrad never lived to see the cathedral he started reach its full height. He died in 1261, more than six centuries before the cathedral was completed in 1880.

Change at Caltech can feel frustratingly slow. When controversial topics bubble up, student anger can erupt into a vicious thunderstorm, only to dissipate within a week. But the decision making process runs at a far longer timescale than just a few days or weeks. The last major revision to Core, which was put into effect 5 years ago, was an agonizing process that took two years to finish. The new unit changes enacted this year were

drawn up over a 5 month span, and were under consideration for an even longer period.

The slow timescale of decision making poses many difficulties for students. Student leaders cycle out on an yearly schedule, meaning the students who take part in early discussions are often not the same ones there at the end. Why do decisions take such a long time? A common answer is that administrators have a sinister strategy of drawing out discussions for as long as possible, in hopes of and tiring out potential student opposition.

While I don't have sworn testimonies from administrators disavowing such a strategy taken under the pain and penalty of perjury, I do have a more mundane explanation for the seemingly lethargic pace of change. The third component of the academic changes approved last May are potential changes to pass fail. The proposal is to take all non-core classes off of pass fail for the first two terms (there is a list of exceptions - Ma2/3, Ph2/12, Bi 8, Ch41, and any class only offered on pass fail). These changes were supposed to be approved last May, at the same time the new eligibility guidelines were put into place. However,

the proposal had to be approved by the Core Curriculum Steering Committee, which signed off on the changes last November. The proposal should have then gone to the Curriculum Committee, but the CCSC decided to delay passing it along and to wait for feedback from the Student Faculty Conference. After consulting with the dozen option SFC committees, the CCSC formally passed the proposal to the Curriculum Committee in March, where it is now being debated.

Over an year has elapsed since the changes to pass fail were first proposed. Having been a part of the process since last April, I've seen no efforts by faculty to intentionally drag it out. To the contrary, there were active efforts to pass these changes in a timely manner, since they were meant to be included with the other package of academic changes last May. Instead, the decision has taken so long because the faculty members responsible are incredibly busy, and because there were deliberate efforts to give time for students to voice feedback. The faculty members most involved with the changes - Gil Refael, John Hall, and Alan Weinstein - wear many hats, and have much more to do than prod academic changes along. These faculty members teach classes and sit on countless other

committees, not to mention spend enormous amounts of time on their research. Change can sometimes unfold slowly, because enacting academic changes is not the only or even the primary responsibility of the faculty who are charged with the task.

If students wish to be a part of big decisions, we must understand that they take time and be prepared for protracted discussions. Student leaders must present consistent arguments and strive for continuity when turnovers inevitably happen. Clear documentation is an essential tool for building enduring efforts. Like the cathedral builders of the thirteenth century, students must also accept a disheartening reality: the people who begin a project may no longer be around when the project is finally completed and bears fruit.

This doesn't mean that students must accept a slow pace of change. Student opinion often echoes throughout the houses, outside of earshot of administrators. But students have plenty of levers to pull to let administrators know what we care about. Vice Provost Cindy Weinstein holds monthly office hours that anyone can sign up for. Many faculty members regularly read the Tech

to learn what students care about. Students can also simply email an administrator - whether it be a dean, option representative, or someone else - and set up a one-on-one meeting. Students should also talk to the students that have been elected into office who are charged with communicating with faculty (my email is tliu@caltech.edu and you can message me on facebook). And ultimately, many changes do happen fast enough for the same students to be a part of discussions from beginning to end.

To use an analogy perhaps more apt for Caltech, trying to shape the direction of the Institute can be like building a starship. It's a process that is long, difficult, and fraught with uncertainty. The people who cut the first piece of steel may no longer be around or involved when the starship reaches its destination. For students who wish to help build cathedrals and starships, it is an exercise that demands persistence and patience. A robust set of blueprints and good documentation is critical to passing on the task from one group to the next. And although shaping the future of Caltech isn't quite as bold as voyaging to another star, it is still a worthwhile endeavor.



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Inventing Tools for Detecting Life Elsewhere

Whitney Clavin
Caltech Media Relations

This article is adapted from a story that was originally published online at caltech.edu.

Recently, astronomers announced the discovery that a star called TRAPPIST-1 is orbited by seven Earth-size planets. Three of the planets reside in the “habitable zone,” the region around a star where liquid water is most likely to exist on the surface of a rocky planet. Other potentially habitable worlds have also been discovered in recent years, leaving many people wondering: How do we find out if these planets actually host life?

At Caltech, in the Exoplanet Technology Laboratory, or ET Lab, of Associate Professor of Astronomy Dimitri Mawet, researchers have been busy developing a new strategy for scanning exoplanets for biosignatures—signs of life such as oxygen molecules and methane. These chemicals—which don’t naturally stick around for long because they bind with other chemicals—are abundant on Earth largely thanks to the living creatures that expel them. Finding both of these chemicals around another planet would be a strong indicator of the presence of life.

In two new papers to be published in *The Astrophysical Journal* and *The Astronomical Journal*, Mawet’s team demonstrates how this new technique, called high-dispersion coronagraphy, could be used to look for extraterrestrial biosignatures with the planned Thirty Meter Telescope (TMT), which, when completed by the late 2020s, will be the world’s largest optical telescope.

Using theoretical and laboratory models, the researchers show that this technique could detect biosignatures on Earth-like planets around M-dwarf stars, which are smaller and cooler than our sun and the most common type of star in the galaxy. The strategy could also be used on stars like our own sun, using future space telescopes such as NASA’s proposed Habitable Exoplanet Imaging Mission (HabEx) and Large UV/Optical/IR Surveyor (LUVOIR).

“We’ve shown this technique works in theory and in the lab, so our next step is to show it works on the sky,” says Ji Wang, one of the lead authors on the two new papers and a postdoctoral scholar in the Mawet lab. The team will test the instrumentation on the W. M. Keck Observatory in Hawaii this year or next.

The new technique involves three main components: a coronagraph, a set of optical fibers, and a high-resolution spectrometer. Coronagraphs are devices used in telescopes to block or remove starlight so that planets can be imaged. Stars outshine

their planets by a few thousand to a few billion times, making the planets difficult to see. Many different types of coronagraphs are in development; for example, Mawet’s group recently installed and took initial images with its new vortex coronagraph on the Keck Observatory.

Once an image of a planet has been obtained, the next step is to study the planet’s atmosphere using a spectrometer, an instrument that breaks apart the planet’s light to reveal “fingerprints” of chemicals, such as oxygen and methane. Most coronagraphs work in conjunction with low-resolution spectrometers. Mawet’s new technique incorporates a high-resolution spectrometer, which has several advantages.

One main advantage is in helping to further sift out the unwanted starlight. With high-resolution spectrometers, the spectral features of a planet are more detailed, making it easier to distinguish and separate the planet’s light from the lurking starlight.

What this means is that, in Mawet’s method, the coronagraph does not have to be as good at

sifting out starlight as was thought necessary to characterize Earth-like worlds.

“This new technique doesn’t require the coronagraph to work as hard, and that’s important because we can use current technologies that are already available,” says Mawet, who is also a research scientist at the Jet Propulsion Laboratory (JPL), which is managed by Caltech for NASA. “With a high-resolution spectrometer, we can improve the sensitivity of our system by a factor of 100 to 1,000 over current ground-based methods.”

Another advantage of using high-resolution spectrometers lies in the richness of the data. In addition to providing more detail about the molecular constituents of a planet’s atmosphere, these instruments should be able to reveal a planet’s rotation rate and provide rough maps of surface features and weather patterns. “It’s a long shot, but we might even have the ability to look for continents on candidate Earth-like planets,” says Mawet.

In the team’s design, the coronagraph is connected to the high-resolution spectrometer using a set of optical fibers. Surprisingly,

laboratory experiments revealed that the fibers also filter out starlight.

“This was completely serendipitous,” says Garreth Ruane, co-author on the two new papers and a National Science Foundation postdoctoral fellow in Mawet’s group. “It’s icing on the cake.”

Next, the researchers will demonstrate their technique at the Keck Observatory. Although the instrumentation cannot yet study potential Earth-like planets—that will require the larger Thirty Meter Telescope—the system should be able to reveal new details about the atmospheres of larger gas exoplanets, including exotic varieties that are nothing like those in our own solar system.

“This new innovation of combining the coronagraph with a high-res spectrometer gives us a clear pathway to ultimately search for life beyond Earth.”

The first study, titled “Observing Exoplanets with High-Dispersion Coronagraphy. I. The Scientific Potential of Current and Next-Generation Large Ground and Space Telescopes,”

led by Wang and appearing in *The Astronomical Journal*, includes Caltech co-authors Mawet, Ruane, visiting associate Renyu Hu, and postdoctoral scholar Bjoern Benneke.

The second study, titled, “Observing Exoplanets with High-Dispersion Coronagraphy. II. Demonstration of an Active Single-Mode Fiber Injection Unit,” led by Mawet and appearing in *The Astrophysical Journal*, includes Caltech co-authors Ruane and Wang; Caltech summer students Wenhao Xuan, Daniel Echeverri, and Michael Randolph; graduate student Nikita Klimovich; postdoctoral scholar Jacques-Robert Delorme; assistant research engineer Jason Fucik; and Associate Director for Development of Caltech Optical Observatories

Richard Dekany. JPL co-authors include James K. Wallace, Gautam Vasisht, Bertrand Mennesson, Elodie Choquet and Eugene Serabyn.

Both studies were funded by Caltech, the National Science Foundation, and the Heising-Simons Foundation.



Artist's rendering of the future Thirty Meter Telescope.

Photo courtesy of Caltech/IPAC-TMT

Throwers highlight second track & field multi-dual

GOCALTECH.COM
Actual Sports Content Editor

REDLANDS, Calif. (Apr. 1, 2017) – Caltech track & field's young group of throwers continued its impressive season to highlight the second SCIAC Multi-Dual of the spring in Redlands, Calif. on Saturday.

Freshmen Tim Krasnoperov and Alexa Lauinger had big days across the board, while junior Zane Murphy got back on track with a season-high-matching effort in the shot put. Krasnoperov was just off his best mark in the discus, yet still managed to place third overall, while adding over two meters in the hammer as he improved on every throw to put himself just outside of the Top-5 in program history. Lauinger posted personal-best marks in all three events to place sixth in the discus while adding nearly two meters in the hammer and ranking seventh in program history with a 1.5-foot improvement in the shot put.

"I'm pleased with our progress," Head Coach Ben Raphelson said. "We're getting closer to where we'll need to be in one month at the SCIAC Championships."

Several other Beavers placed well in the overall competition, including sophomore

Michaëlle Marasigan finishing fourth with a slight drop in the 800-meter run and freshman Tanner Moore blazing through his last 200 meters in the 1500m to finish sixth.

Senior Lucy Chen continued her steady progression of season bests with a 14-foot long jump, with sophomore Ben Calvin shaving .07 in the 110m hurdles after a promising showing the week prior.

The Beavers' distance corps managed to drop time despite challenging conditions on a hot and windy day, particularly in the 5k where freshman Bhairav Chidambaram and sophomore Michael Hashe shaved nine and 20 seconds, respectively. Sophomore Joey Hong and junior Gene Vaughan trimmed two and three seconds, respectively, in the 1500m, a race in which both freshmen Sam Blazes and Nicole Feng also lopped off seven seconds.

Freshmen Damien Berube and Alex Lettenberger improved slightly in the pole vault, with Lettenberger also trimming .37 in the 200-meter dash and running a key leg alongside classmates Tommy Alford, Jesse Cai and Tiger Lu on the 4x400m relay that posted a 10-second improvement at 3:39.13.



Honestly, this is one of the more graceful throwing photos I've seen. Such photogenic, much wow.
-gocaltech.com

Percin tallies five against La Verne

PASADENA (Apr. 6, 2017) – Sophomore Brittany Percin found the net five times in another productive outing against the University of La Verne on Wednesday.

Percin got the Beavers on the board early, scoring the game's third goal and first for her team on a blistering shot from about 15 feet out. All of Percin's goals came from

open looks in front of the net and she had plenty of opportunities, taking 14 of her team's 20 total shots. Her last goal came with just over four minutes to play in the game.

Senior Mary Boyajian also scored on her only shot of the game, converting on a strike in the third quarter. Freshman goalkeeper Sarah Kreider stopped seven La Verne shots.



"Mary throw the damn ball already!" - that goalie ;)

-gocaltech.com



Brittany contemplates which corner of the goal will be her next victim.

-gocaltech.com

Levine homers, Beavers nearly steal Pomona-Pitzer Series

GOCALTECH.COM
Actual Sports Content Editor

POMONA, Calif. (Apr. 1, 2017) – Lightning nearly struck twice for the Caltech baseball team this weekend. After picking up its first SCIAC victory since 1988 the prior afternoon against Pomona-Pitzer Colleges, the Beavers hit the road on Saturday to complete the series with the Sagehens.

Sophomore Garrett Levine hit his first home run of the season, the third of his career as the Beavers fell to the Sagehens, 6-5, in 10 innings.

Game 1: Caltech 5, Pomona-Pitzer 6

The timing of Levine's home run could not have been better, both in-game and as pertaining to his season. The sophomore came to bat with one out in the top half of the 10th inning and hit a solo shot into left field to give the Beavers the lead, though the Sagehens would rally in the bottom half to ultimately win the game. Levine entered the game hitting just .213 with nine RBIs, just one year removed from leading the team in RBIs. The home run could be a sign of better things to come.

Sophomore Mark Burluson, who entered the day leading his team with 15 RBIs,



"I wondered why the ball kept getting bigger and bigger, and then it hit me." - Garrett

Photo Courtesy of Ellen Bublick

put the Beavers in a position to win the game in extra innings when he slapped a single into left field to score lead-off man Harrison Jacobs, tying things up at four. Both Burluson and Jacobs did wonders for their batting averages by each connecting on three hits. Burluson tripled in the third inning while Jacobs finished the game with two doubles. Junior Chris McCarren picked

up two hits and sophomore Connor Moffatt led all Beavers with two RBIs.

After sophomore Jonah Krop earned a complete game victory the just one day prior, senior Kai Kirk pitched similarly well, yielding three runs in five innings while striking out two Sagehens. Typical Game 3 starter Cortland Perry relieved Kirk and pitched out the remainder of the game. He

struck out five batters over 4 and one-third innings.

Game 2: Caltech 6, Pomona-Pitzer 16

The Beavers did not fare as well in the third and final game of the Pomona-Pitzer series after dedicating all the remaining adrenaline from Friday towards the extra innings effort earlier in the day. With Cortland Perry having thrown four innings in the prior game, senior Tim Menninger started his second game of the season.

Caltech's best inning came in the fourth when they put together a four-run burst. Jacobs carried his momentum over from the first game and singled into center field to score left fielder Kirk and junior first baseman David Watson. Moffatt entered the batter's box next and scorched a double down the right field line to score the hero from Friday's game freshman Alex Corado while Jacobs wheeled his way to third base. Jacobs reached home on a wild pitch shortly after. Burluson, McCarren, Levine and Kirk all registered two hits, while Jacobs' two RBIs were a team high. A strategic double steal in the second inning netted stolen bases for both McCarren and Levine, moving McCarren to 11-for-11 in stealing situations this season.

Join the Meditation Mob!

Tuesdays, 12:00 - 12:50

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

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ASCIT Minutes

Meetings are every week in SAC 13



A 3-workshop series offered twice this term. Pre-screening is required - call the counseling center's front desk at (626) 395-8331 for more information.

- Learn how stress affects you, and make a personalized stress response profile.
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- Get a clearer sense of your moment-to-moment experiences.
- Learn how to separate from unhelpful patterns of thinking.
- Get a clearer sense of what's important to you, and how you can make choices in line with that.

Section 1: Wednesdays 4:00 - 5:00, April 19, April 26, and May 3rd

Section 2: Mondays 4:00 - 5:00, May 8, May 15, and May 22nd

Location: 229 Sherman Fairchild Library

ASCIT Board of Directors Meeting

Minutes for 7 April 2017. Taken by Alice Zhai.

Officers Present: Andrew Montequin, Tim Liu, Rachael Morton, Sakthi Vetrivel, Kalyn Chang, Robin Brown, Alice Zhai

Guests: Jason Marshall

Call to Order: 12:20pm

President's Report (Andrew):

- Joe Shepherd is working with Felicia Hunt to assemble groups for Bechtel discussion
- Caltech Postdoc Association pitched for funding for March for Science event
- ASCIT meets with Joe Shepherd next Wednesday, April 12

Officer's Reports:

V.P. of Academic Affairs (ARC Chair: Tim):

- Potentially changing pass/fail policy to prevent students from taking non-core curriculum classes on pass/fail
- Will send survey about recording class lectures
- Attending next faculty board meeting to present SFC feedback

V.P. of Non-Academic Affairs (IHC Chair: Rachael):

- IHC secretary appointment will be on Sunday, April 9
- Working to assemble small groups for Bechtel discussion
- IHC met with Joe Shepherd last week

Director of Operations (Sakthi):

- Want to set up online form that streamlines the ASCIT equipment request process
- ASCIT email accounts on donut do not work
- Unregistered clubs have equipment in ASCIT club storage room
- Yearbook needs to appoint a new business manager
- Need to publicize ASCIT's Netflix account for the screening room

Treasurer (Kalyn):

- Multihouse funding pairs for this term are Fleming/Lloyd, Page/Avery, Blacker/Ricketts, and Dabney/Ruddock

Social Director (Robin):

- ASCIT formal is on Saturday, April 8th
- Anyone who shows up to formal without registration will get CRC-ed

Secretary (Alice):

- Nothing to report

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.

Meeting Adjourned: 12:53pm

Save The Dates - Billy Goat

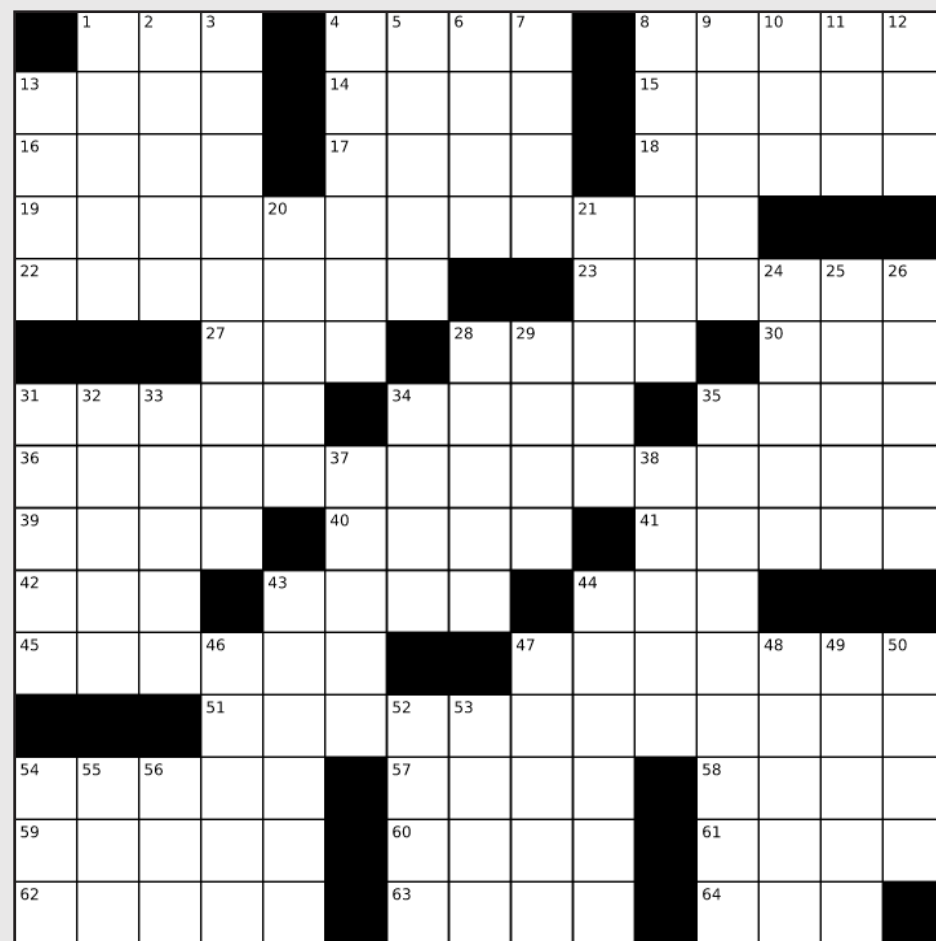
Across

- Palpatine's title, for short
- Stops up
- Detection system
- Opposite of 13-down
- Amend
- Poet Dickinson
- Arm bone
- Mouth: Sp.
- Stop
- March 25th to June 9th
- Garden State capital
- Ship's steering mechanism
- Roof goop
- At once
- Diminutive suffix
- 2005 horror sequel
- Encourage, as a felon
- Frozen reindeer?
- April 14th to April 16th
- Coral formation
- Before sodium, periodically
- Late times, in ads
- Key below "Home"
- Ursa Major, e.g.
- eSports organization founded in 2009
- Relax

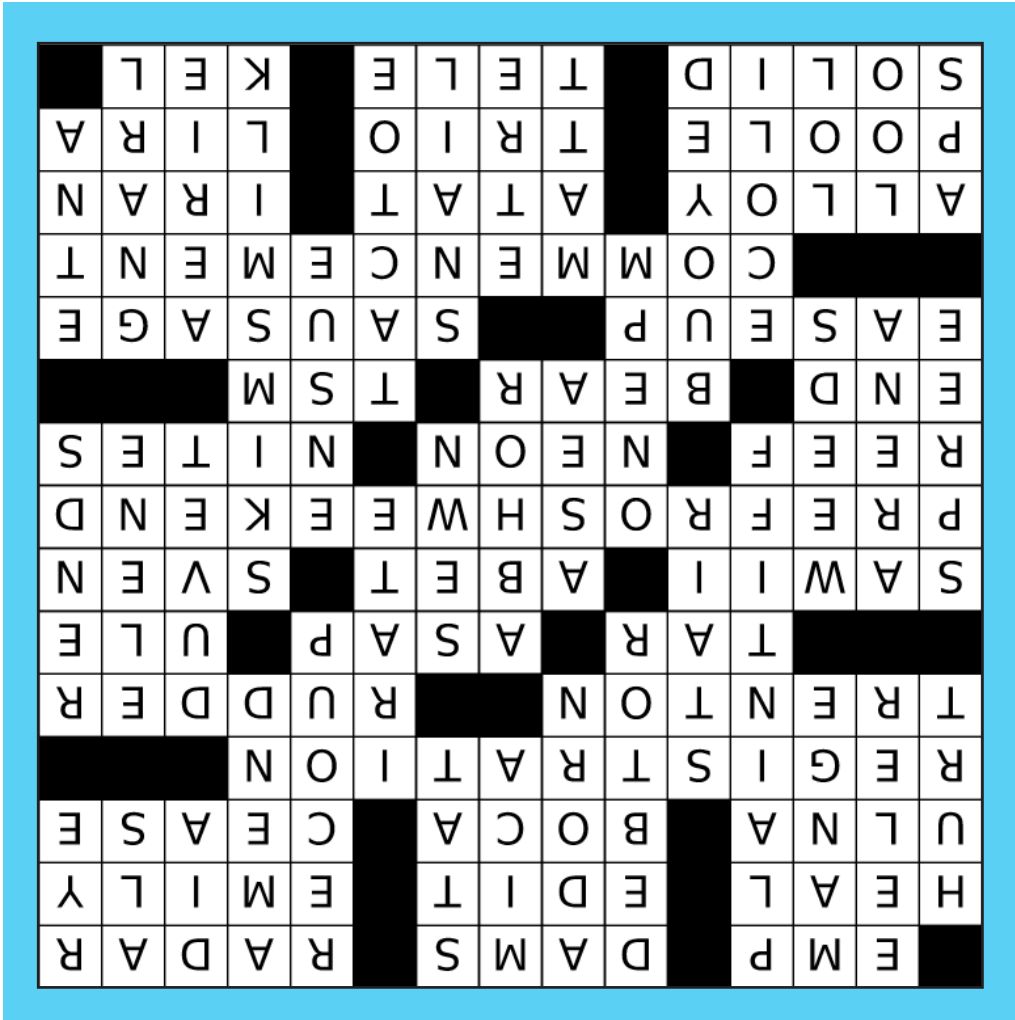
- Tubular meat
- June 16th
- Bronze, e.g.
- "The Empire Strikes Back" four-legged tank
- Party in a notable Reagan affair
- Jekyll's butler
- Threesome
- Capital of Turkey?
- Bronze, e.g. (at STP)
- The "T" in TV
- Kenan's partner on an old Nickelodeon sitcom

Down

- Skinny fisherman?
- Dog disease
- Courtroom figure
- One in the hole
- Spruce up, as a spruce
- Type of sheet silicate
- Ma 3 topic
- Get back
- Revise
- Day: Sp.
- Lou Gehrig's disease, initially
- Bakery buy
- Opposite of 13-across
- Part of a flight
- Furious
- Comforter
- Old English poem
- Separates
- Despise
- Stitched up
- Binge
- The Colosseum, e.g.
- Unwanted vegetation
- Between ports
- Makes a healthier dairy drink, perhaps
- End of the lunch hour
- Result
- Kept afloat
- Tic-____-_____
- Model organism
- Gary who lives in a pineapple, for one
- Eagle's nest
- Contort
- Sicilian peak
- Kim's indie pop partner
- To be: Fr.
- HS tests that Caltech doesn't give credit for
- John
- Online chuckle



Answers to current crossword (pg 7)

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